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SERIES 15 No. 1

AUGUST, 1911

BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

6154

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

FOR BULLETIN AND TERMS ADDRESS CHARLES H. EAMES, PRINCIPAL

12-22
2282

Progress

With the issue of this August Bulletin the school reaches a place in its life when it is looking forward to another year of active usefulness to the textile interests. As it looks back with pride upon the fourteen years of its steady growth, it also looks forward with greater interest to the ever increasing needs of the school and greater problems to be solved that its advancement may continue.

Its growth has been in widening its curriculum in order to place itself in the highest class of technical schools, in steadily raising its entrance requirements that more and better work may be accomplished, in requiring a higher standard within the school that men of better training may enter the industry, and in adding to the equipment and floor space to facilitate the work of student and instructor, thus widening the field of instruction and increasing the scope and efficiency of the school. To meet all of these expansions the buildings have been enlarged at three different times and now the superstructure of the new boiler house is being raised from the foundations in order that by another year the space occupied by the present power plant may be used to meet the demand for more floor space for the Cotton Yarn and Engineering Departments. During each year additional equipment has been placed in the several departments and the present year is no exception with the new lathes, shaper, universal grinder, forges, small tools, and bench room for the machine shop. To the equipment of wood working tools already in use there is to be added this year sufficient machinery to commence instruction in pattern making. To the worsted spinning machinery are to be added a French Comb and intersecting gill boxes.

It has been the aim of the school to give the best training possible to young men entering the textile industry, and to improve to the highest point, the efficiency of those already engaged in it. It is felt that this has been done, but the field of usefulness of the school widens and the opportunities and needs for its service grow at a greater rate than means to meet those needs are available. While it has not been possible to add a fourth year to the regular school work yet the value of such a step has been appreciated for some time. A commencement leading to this step has been taken in the way of a post-graduate

non-resident course. This has considered as far as possible the subjects of industrial efficiency, business law, accounting, banking, etc., and has resulted in some of the class members improving to a marked degree the efficiency of their respective mills or departments. If no other results were obtained than those already reported the course of instruction would be justified. It is, however, expected that there will be a fourth year added to the resident course within a short time.

There have been some resignations from the corps of instructors due to more attractive positions in either industrial or educational fields. Henry A. Crompton of the Wool Department enters the Pacific Mills as overseer of Spinning, and his place is to be taken by Eugene C. Woodcock, L. T. S., 1907, and instructor in the Wool Department. John C. Lowe, L. T. S., 1911, an experienced spinner from the Wood Worsted Mills enters this department.

In the Chemistry and Dyeing Department Mr. George A. Cushman resigned to accept a position in the English High School of Boston, while Robert Kirkpatrick, Clark College 1911, and Reginald S. Bohner, Dalhousie University, 1901, McGill University, 1906, and University of Berlin, become new instructors in this department. Mr. Bohner has had four years experience as instructor at McGill University. Lester H. Cushing, Harvard, 1911, takes the position in History and Modern Languages made vacant by the resignation of John Clement. In the Design and Weaving Department Arthur F. Ferguson resigned to take up work for the Tariff Board at Washington, and his duties will be ably filled by Stewart Mackay, L. T. S. 1906, and an instructor in this department. John C. Standish, L. T. S., 1911 takes the place of Frank L. McCool resigned, as assistant instructor in Dyeing.

With the increased equipment in the machine shop the necessity of a permanent instructor becomes imperative and for the coming year Charles H. Jack of the Amoskeag Mfg. Co. and of L. T. S. has been engaged. An additional instructor will be engaged for the mechanical drawing in the Engineering Department.

As in previous years the building construction work of the new boiler house referred to above is being carried on under the immediate charge of George H. Perkins, Head of the Department of Engineering, assisted by Ulysses J. Lupien of the same department.

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FOR BULLETIN AND TERMS ADDRESS CHARLES H. EAMES, PRINCIPAL

Positions Seeking the Graduate

The list of graduates of the Lowell Textile School is given in the catalog each year and is revised with each issue. This list contains the full names of the graduates, the course pursued, the year the diploma was awarded, the present position held, name and location of employer. This list, which is growing rapidly, is the best answer to the question "What sort of positions do the graduates of the Lowell Textile School secure?"

The question, however, is frequently asked "What sort of positions are offered to the new graduates?" It is with the attempt to give some idea concerning inquiries which come to the school that we reproduce portions of letters received from those seeking the graduates.

A firm of commission merchants writes:—

"We would like to secure the services of a young man for general analyzing and designing on plain, fancy, and Jacquard cotton goods. We think a third year cotton man from your school would just fill the bill. If you have a young man who is desirous of getting into business at present we should be very glad to hear from you and take the matter up with him. The position which we have open entails a good future for the right man. The writer some five years ago was at your school and secured the services of Mr. C. who proved to be the right man in the right place. We should like to secure a young man of his calibre, if possible."

A woolen manufacturer sent the following letter a few months ago:—

"This company is going to take on a young man to learn the business of woolen blanket manufacture with the prospects of rapid advancement. If it is your custom to assist graduates in obtaining positions and you know of some available candidate at the present time, the writer would be pleased to call on you and explain more fully what is wanted."

It is interesting to know that one of the graduates was selected and has been successful in meeting the requirements of the position.

A large print works wrote us at length and we produce herewith a part of their letter:—

“It is our intention in the future to try and make positions for Textile School graduates with the idea of having young men, who have had a technical training, coming along to fill positions that may be open in our print works. This policy has not been pursued in years past but we feel that such a course will prove beneficial to us provided we can get hold of the right character of young men. Any assistance that you can give me in making a proper choice will be greatly appreciated. I require an assistant in our laboratory at the present time and if you can suggest anyone for the position I would be under obligations to you.”

This resulted in two of the recent graduates entering the employ of this concern.

That Master Mechanics departments seek textile school graduates is evidenced by the following letter:—

“I have a chance to place a young man in the mechanical department of a large cotton mill in this state, and would be glad to have you give me the name of one or more candidates for the position if you have any to recommend. What is required is someone who is looking for a chance to get a start in a position where he will have a chance to advance and if he has the right stuff in him it is quite possible that he may in time be the master mechanic of the plant. It is essential that he have some knowledge of drafting. He ought also to have had some machine shop experience.”

Another branch of the textile industry which has sought graduates of this school is the narrow fabric business. Not a great while ago a letter was received and we quote a part from it.

“We are contemplating putting into our office in a confidential capacity, a young man whose work along the line of costs, etc., would give him an exceptional opportunity of learning the narrow fabric business. We have been hoping to find some young man of a good family, good physique, and some education who could take hold of this work for us. Our idea has been to get hold of a young man who is somewhere in the vicinity of 20 to 25 years, possibly younger, and it occurred to us that if we could get hold of some fellow who had had some technical training, such as you furnish, it might be to our advantage. Among your students have you anyone to suggest for a position of this kind?”

The Mills, Commission Houses, or Shops do not offer the only field for graduates. Those who may have some literary ability as well as some technical knowledge of textile processes and materials find positions with trade papers, or publishers of textile works.

This line of work is illustrated by the following letter:—

“Your advertisement in the _____ suggests that you may be able to give me the address of some recent graduate of your school who would be qualified to take an editorial position in which a thorough knowledge of the textile industry is a requirement. We are in correspondence with a publisher who has a good opportunity to offer to a textile engineering graduate. The position will pay \$25. to \$30. a week at the start and to the right man advancement to a more responsible and higher salaried position is assured. I should appreciate any suggestion you may make along the lines I have indicated. In general we are likely to have from time to time good opportunities of this sort. We may be able in this way to assist some of your graduates.”

The United States Government finds that graduates of this school have the requisite preparation to fill positions in certain departments. The following letter indicates this:—

“I beg to acknowledge the receipt of your letter of June 6th in reply to mine of the 2d inst. suggesting three of your graduates for the position of Examiner of Merchandise in the Appraiser's Department. I wish to thank you for your information. The Government is in need of men who have had the technical training which your school gives them.”

A second letter reads:—

“It is the desire of the Bureau to secure the services of a man well qualified along the lines of wool investigation. Will you kindly furnish us with the names of two or three of your last year's graduates of good standing whom you would consider properly qualified to take up work along this line? Any assistance which you may render us will be greatly appreciated.”

These letters have been selected from a number in order that they may be representative of the inquiries that come to us, and also to show the breadth of field in which graduates may find lucrative and congenial employment.

ANNUAL REPORT

OF THE

TRUSTEES

OF THE

LOWELL TEXTILE SCHOOL

OF

LOWELL, MASSACHUSETTS, U. S. A.

FOR

1911



BOSTON:

WRIGHT & POTTER PRINTING CO., STATE PRINTERS,

18 POST OFFICE SQUARE.

1912.

ANNUAL REPORT OF THE TRUSTEES OF THE LOWELL TEXTILE SCHOOL FOR 1911.

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled.

The trustees of the Lowell Textile School of Lowell, Mass., respectfully submit the following report for the calendar year 1911, in compliance with chapter 248, Acts of 1904, which provides: —

SECTION 1. The trustees of every textile school receiving financial aid from the commonwealth shall, on or before the thirtieth day of January in each year, make to the general court a report containing a concise statement as to the buildings, equipment and resources of the school, the courses and methods of instruction, the number of teachers and students, if any, who graduated therefrom. The report shall also contain a statement, verified by the oath of the treasurer of the school, and in such form as the auditor of accounts of the commonwealth shall prescribe, showing separately the amounts received during the previous calendar year from tuition fees, from the commonwealth, from any city or town, and from all other sources, and also showing the expenditures of the school during the same period, under the heads of maintenance, construction, and new equipment, and also the financial condition of the school at the close of said year.

TRUSTEES OF THE LOWELL TEXTILE SCHOOL IN ACCOUNT WITH A. G. POLLARD, TREASURER.

LOWELL, MASS., Dec. 31, 1911.

MAINTENANCE ACCOUNT.

Paid for teachers' salaries,	\$36,470 31	
for administration salaries,	6,175 86	
for employees' salaries,	6,895 99	
for general expense,	10,735 25	
for supplies,	3,624 80	
for power and light,	5,440 85	
for special service,	787 44	
for chemistry deposits,	1,050 59	
for insurance,	3,326 60	
for refund of tuition,	21 40	
	<hr/>	\$74,529 09

Deduct ledger debits as follows:—

Cash received from chemistry deposits, . .	\$3,163 88	
from supplies, books sold, . .	1,753 78	
from special service, . .	821 59	
from stock sold, . .	200 39	
from use of telephone, . .	5 96	
from rebate of insurance, . .	3,031 99	
from students (breaking glass), . .	50	
from sale of sundry items, . .	42 03	
from insurance, account accident and fire,	59 00	
	<hr/>	9,079 12
Net cost of maintenance for 1911,		\$65,449 97

Cash received from Commonwealth of Massa- chusetts,	\$40,000 00	
Cash received from city of Lowell,	8,000 00	
Cash received from tuitions,	17,724 54	
	<hr/>	\$65,724 54
Surplus Jan. 1, 1912, carried to equipment,		\$274 57

EQUIPMENT ACCOUNTS.

Old Equipment Account.

Cash on hand Jan. 1, 1911,	\$723 22	
Surplus transferred from maintenance account, . .	274 57	
Amount expended during 1911,		\$996 05
Balance on hand Jan. 1, 1912,	1 74	

New Equipment Account.

Amount received from Commonwealth of Massa- chusetts,	\$6,955 00	
Amount expended during 1911,		4,247 18
Balance on hand Jan. 1, 1912,	2,707 82	

Chemistry and Dyeing Equipment Account.

Cash on hand Jan. 1, 1911,	\$1,124 48	
Amount expended during 1911,		\$1,014 15
Balance on hand Jan. 1, 1912,	110 33	
	<hr/>	<hr/>
Total paid for equipment,		\$6,257 38
		<hr/>

CONSTRUCTION ACCOUNTS.

Colonial Avenue Building.

Cash on hand Jan. 1, 1911,	\$14 59
Balance on hand Jan. 1, 1912, carried to boiler house account,	14 59
	<hr/>

Boiler House.

Cash on hand Jan. 1, 1911,	\$1 61	
Amount received from Commonwealth of Massa- chusetts,	22,700 00	
Amount received from sale of man hole cover, Amount transferred from boiler house account,	5 08 14 59	
Amount expended during 1911,		\$12,515 01
Balance on hand Jan. 1, 1912,	10,206 07	
	<hr/>	<hr/>
Total paid for construction,		\$12,515 01
		<hr/>

SUMMARY OF RECEIPTS AND EXPENDITURES.

	Received.	Paid.
Cash on hand Jan. 1, 1912,	\$1,865 56	—
Maintenance,	65,724 54	\$65,449 97
Equipment,	6,955 00	6,257 38
Construction,	22,705 08	12,515 01
	<hr/>	<hr/>
	\$97,250 18	\$84,222 36
Loans,	67,500 00	67,500 00
Cash on hand Jan. 1, 1912,	—	13,027 82
	<hr/>	<hr/>
	\$164,750 18	\$164,750 18
	<hr/>	<hr/>

FINANCIAL CONDITION DEC. 31, 1911.

	<i>Trial Balance.</i>	Dr.	Cr.
Lowell Textile School,		—	\$617,626 02
Land,		\$105,639 09	—
Machinery and equipment,		235,595 53	—
Supplies,		15,266 60	—
Notes payable,		—	50,000 00
Southwick Hall,		142,120 30	—
Kitson Hall,		31,390 91	—
Weave building,		22,150 07	—
Boiler house,		35,388 56	—
Weave wing extension,		30,061 73	—
Falmouth Street building,		15,000 00	—
Colonial Avenue building,		21,985 41	—
Cash,		13,027 82	—
		<hr/>	<hr/>
		\$667,626 02	\$667,626 02
		<hr/>	<hr/>

Notes Payable.

Note dated Oct. 9, 1909, on demand,	\$17,500 00
Note dated Nov. 9, 1911, on demand,	5,000 00
Note dated Nov. 21, 1911, on demand,	10,000 00
Note dated Dec. 30, 1911, on demand,	10,000 00
Note dated Dec. 30, 1911, on demand,	7,500 00
	<hr/>
	\$50,000 00

SPECIAL TRUST FUND ACCOUNT JAN. 1, 1912.

Special Book Prize Fund.

Amount contributed by Prof. Louis A. Olney for prizes of books to honor students in chemistry and dyeing:—

Balance on hand Jan. 1, 1911,	\$12 78	
Cash received,	98 00	
Amount paid for prizes awarded June, 1911,		\$25 00
Balance on hand Jan. 1, 1912,		85 78
	<hr/>	<hr/>
	\$110 78	\$110 78

The above special fund is not included in the general account.

To the Trustees of the Lowell Textile School.

This is to certify that I have examined the books of the treasurer of the Lowell Textile School for the year ending Dec. 31, 1911, and find them to be correctly kept and properly vouched.

A. A. LUDWIG,
Auditor for the Corporation.

LOWELL, MASS., Jan. 29, 1912.

LOWELL, MASS., Jan. 30, 1912.

I certify that the foregoing is a correct statement of the receipts and expenditures on account of the Lowell Textile School during the calendar year 1911, and of the financial condition of the corporation at the close of said year.

ARTHUR G. POLLARD, *Treasurer,*
Trustees of the Lowell Textile School.

LOWELL, MASS., Feb. 5, 1912.

MIDDLESEX, SS.

Subscribed and sworn to before me this day.

JOHN F. SAWYER,
Justice of the Peace.

Approved as to form.

JOHN E. WHITE, *Auditor of the Commonwealth.*

STATEMENT AS TO BUILDINGS, EQUIPMENT, RESOURCES, ETC,

LAND.

Land bounded by Standish, Riverside and Moulton streets, and Merrimack River and Colonial Avenue, about 14 acres,	\$105,639 09
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SCHOOL BUILDINGS.

Southwick Hall: 80 by 265 feet; three stories, with two-story wings and finished basement under all; cost,	\$142,120 30
Kitson Hall: 63 by 184 feet; one story, with basement; cost,	31,390 91

Boiler house: 63 by 68 feet; one story; cost,	\$14,875 16
Falmouth Street buildings: 80 by 192 feet; three stories, with basement; cost,	67,211 80
Colonial Avenue laboratories; cost,	21,985 41
Total cost of buildings,	<u>\$277,583 58</u>

The floor space is divided between the departments and offices as follows:—

	Square feet.
Cotton yarns,	12,000
Woolen and worsted yarns,	28,160
Decorative art,	1,446
Textile design,	15,360
Chemistry and dyeing,	28,400
Power weaving,	15,360
Finishing,	5,806
Mechanical and electrical engineering,	15,729
Power plant,	5,000
Administration,	2,930
Assembly and physical culture halls,	10,800
Entrances, corridors, stairways, toilets, store and locker rooms,	14,487
Total floor space in all buildings,	155,478
Cost per square foot of floor space,	<u>\$1 79</u>

EQUIPMENT.

Cotton yarn department,	\$33,379 92
Woolen and worsted yarn department,	42,934 94
Textile design department,	12,288 76
Chemistry and dyeing department,	22,913 79
Power weaving department,	19,939 78
Textile engineering department,	21,650 33
Physical laboratory and class room,	1,645 21
Finishing department,	13,796 55
Corridors,	237 50
Trustees' room,	881 40
Lecture hall,	505 36
General office,	686 10
Principal's office,	746 05
Janitor's rooms,	414 03
Lunch room,	220 96
Storeroom,	206 75
Library,	2,759 96
Locker room,	596 00
Students' room,	168 00
Physical culture apparatus,	514 29
Southwick Hall, heating, sprinkling and electrical system,	11,495 79
Kitson Hall, heating and sprinkling system,	1,326 90
Falmouth Street building, heating and sprinkling system,	4,466 80
Power plant,	25,245 91
Miscellaneous equipment pertaining to all buildings and departments,	16,574 45
Total,	<u>\$235,595 53</u>

The increase in value of equipment is:—

Purchased,	\$6,257 38
Contributed or made at the school,	1,587 21
Total,	<u>\$7,844 59</u>

COURSES OF INSTRUCTION.

CLASSIFICATION OF DAY STUDENTS BY COURSES.

	First Year.	Second Year.	Third Year.	Post Graduate.
Cotton manufacturing,	13	7	7	-
Wool manufacturing,	11	7	12	-
Textile design,	11	3	1	-
Chemistry and dyeing,	18	16	14	-
Textile engineering,	15	11	5	-
Course not chosen,	1	-	-	15
	69	44	39	15
Total,				167

CLASSIFICATION OF EVENING STUDENTS BY COURSES.

	First Year.	Second Year.	Third Year.	Post Graduate.
Cotton spinning,	45	18	-	1
Woolen and worsted spinning,	39	15	6	-
Textile designing,	58	23	11	1
Freehand drawing,	22	3	2	4
Elementary chemistry,	37	22	-	-
Textile chemistry and dyeing,	7	4	-	-
Analytical chemistry,	1	1	-	-
Special chemistry,	3	-	-	-
Weaving (cotton),	14	-	-	-
Weaving (woolen and worsted),	19	-	-	-
Weaving (dobby and Jacquard),	5	-	-	-
Mechanics,	132	-	-	-
Steam engineering,	-	30	-	-
Electricity,	-	-	23	-
Mechanical drawing,	47	12	7	-
Machine shop,	28	10	-	-
Finishing,	16	-	-	-
Knitting,	5	-	-	-
	478	138	49	6
Total,				671
Names counted twice,				50
Net total,				621

STUDENTS.

Last year we expected, as shown in our annual report, to open the fall term of 1911 with four-year courses in place of three, with the result of a large increase of pupils, but it was thought desirable by the Legislature that our bills and petition for that purpose should be first considered and reported upon by the State Board of Education. They were therefore so referred with instructions to report to the session of 1912. A special report by that Board (House Document No. 3) embodies the result of such investigation. A complete schedule covering each course for four years by terms is presented in the special report of the Board of Education and is fully approved by the management of the school. It is hoped it will receive the legislative sanction at the current session.

Anticipating the establishment of four-year courses, last year a large number of applications for such courses were received and registered and helped to swell our roster. These we have had to temporarily defer recognition of with the result of quite a reduction of day pupils. Ordinarily this loss would have been made up otherwise, in view of the steadily widening reputation of this school, but for the extraordinary depression in the textile industry, the offers of free-day instruction at other textile schools in special textile branches, and the establishment of industrial schools. The establishment of the latter, however, it is expected will eventually increase the demand for the higher and broader textile education which this school represents. In fact, the increase in evening pupils from Lawrence and vicinity, where for two years an industrial school has existed, — that makes textile education a leading feature, — has resulted in an increase of evening pupils from that section of about 34 per cent. A similar result seems probable, as like schools are established at Lowell or elsewhere within the territory we reach.

Of the day pupils 131 are residents of Massachusetts, 23 from other New England States, 8 from other northern States, 3 from Georgia, 1 from China and 1 from Japan.

Massachusetts pupils pay \$100 per annum, other residents of the United States pay \$150, and foreigners pay \$300, except

ROSTER OF SCHOOL OFFICERS AND INSTRUCTION CORPS.

PRINCIPAL.

Charles H. Eames, S.B., Massachusetts Institute of Technology, 1897. Experience: secretary of the Lowell Textile School and instructor in electrical engineering and mathematics; superintendent, Light, Heat and Power Company, Lowell, and engineer with Stone & Webster, electrical engineers, Boston, Mass.

INSTRUCTORS.

Textile Engineering.

- George H. Perkins, S.B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience: draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood, Greene & Co., Boston, Mass.
- Herbert J. Ball, S.B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906. Experience: draftsman, Watertown Arsenal.
- Ulysses J. Lupien, S.B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.
- Ernest J. Batty, S.B., instructor in mechanical drawing. Massachusetts Institute of Technology, 1911. Experience: draftsman; Narragansett Machine Company, Pawtucket, R. I.
- Charles H. Jack, instructor in machine-shop practice. Lowell Textile School. Experience: Amoskeag Manufacturing Company, Manchester, N. H.

Chemistry and Dyeing.

- Louis A. Olney, A.C., M.S., chief instructor. Lehigh University, 1896. Experience: instructor, Brown University; dyeing and finishing department, Stirling Mills, Lowell, Mass.
- Miles R. Moffatt, S.B., instructor in chemistry. Columbia University, 1901. Experience: assistant instructor in physics, Columbia University; chemist, Mallinckrodt Chemical Works, St. Louis, Mo.; chemist, Atlantic Mills, Providence, R. I.
- Robert R. Sleeper, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday & Sons, Limited, New York City; H. A. Metz & Co., New York City; Hamilton Print Works, Lowell, Mass.; Merrimack Manufacturing Company, Lowell, Mass.
- Howard D. Smith, Ph.D., instructor in chemistry. Tufts College, 1906; Brown University, 1904; Rhode Island College, 1901. Experience: assistant instructor, Brown University and Tufts College; instructor, Beloit College, Wisconsin.
- Robert Kirkpatrick, A.B., assistant instructor in chemistry. Clark College, 1911.
- Reginald S. Bochner, B.Sc., M.Sc., instructor in chemistry. Dalhousie University, 1901; McGill University, 1906; and University of Berlin. Experience: instructor, McGill University.
- Walter E. Hadley, instructor in chemistry. Lowell Textile School, 1908.
- John C. Standish, assistant instructor in dyeing. Lowell Textile School, 1911.

Textile Design and Weaving.

- Hermann H. Bachmann, chief instructor. Gera Textile School, Germany. Experience: Gustav Weise Public Designing House for the City of Gera-Parkhill Manufacturing Company, Fitchburg, Mass.; Lorraine Manu; facturing Company, and Smith Webbing Company, Pawtucket, R. I.
- Stewart Mackay, instructor in textile design and cloth analysis, Lowell Textile School, 1906. Experience: Bay State Mills, Lowell, Mass.; George C. Moore Wool Scouring Mills, North Chelmsford, Mass.
- Starr H. Fiske, assistant instructor in design and weaving department. Lowell Textile School, 1909. Experience: Amoskeag Manufacturing Company, Manchester, N. H.
- Joseph Wilmot, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.; Draper Company, Hopedale, Mass.; Crompton & Knowles Loom Works, Worcester, Mass.
- Albert E. Musard, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder & Ellis, Philadelphia, Pa.
- Elizabeth Whitney, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching eighteen years.

Cotton Yarns.

- Stephen E. Smith, chief instructor. Lowell Textile School, 1900. Experience: draftsman, Lowell Machine Shop, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.
- Herbert C. Wood, instructor in cotton yarns. Lowell Textile School, 1906. Experience: Tremont & Suffolk Mills, Lowell; Whitin Machine Works, Whitinsville, Mass.
- Henry K. Dick, instructor in knitting. Experience: Linnville Hosiery Factory, Lanark, Scotland.

Woolen and Worsted Yarns.

- Edgar H. Barker, chief instructor. Massachusetts Institute of Technology. 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, Mass.; wool scouring.
- John N. Howker, instructor in wool sorting and scouring. Technical School of Saltaire near Bradford, Eng.; certificate from City and Guilds of London, Experience: Saltaire Mills, Yorkshire, Eng.; Goodall Worsted Company, Sanford, Me.; Arlington Mills, Lawrence, Mass.
- Eugene C. Woodcock, instructor in French spinning and woolen and worsted yarns. Lowell Textile School, 1907. Experience: Wood Worsted Mills, Lawrence, Mass.
- John C. Lowe, instructor in woolen yarns. Lowell Textile School, 1911. Experience: Wood Worsted Mills, Lawrence, Mass.

Finishing.

- Arthur A. Stewart, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woolen Manufacturing Company, Montreal, Can.; American Woolen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor in woolen and worsted yarns Lowell Textile School.

CULTURAL COURSES.

Languages and History.

Lester H. Cushing, A.B. Harvard College, 1911.

Physical Culture.

Ralph E. Guillow, physical director. International Y. M. C. A. Training School, Springfield, Mass., 1910. Ten years' experience in physical culture in various schools and institutions.

Archibald R. Gardner, M.D., medical adviser. Harvard University, 1902.

There have been a number of changes in the corps of instructors during the past year, as follows:—

In the textile engineering department, Ernest J. Batty has been engaged as instructor in mechanical drawing. Charles H. Jack of the Amoskeag Manufacturing Company has been appointed permanent instructor in machine-shop practice.

In the chemistry and dyeing department, George A. Cushman resigned to accept a position in the English High School, Boston. His position was filled by Robert Kirkpatrick of Clark College. Reginald S. Boehner of McGill University was also engaged as instructor in chemistry. John C. Standish, L.T.S., 1911, takes the position made vacant by Frank L. McCool, as assistant instructor in dyeing.

In the textile design and weaving department, Arthur F. Ferguson resigned to take up work with the Tariff Board at Washington, D. C. His position was filled by Stewart Mackay, L.T.S., 1906.

In the wool department, Henry H. Crompton, instructor in French spinning, resigned to take a position in the Pacific Mills, Lawrence. His position was filled by Eugene C. Woodcock, L.T.S., 1907. John C. Lowe, L.T.S., 1911, also enters this department as instructor in worsted yarns.

In the department of language and history, Lester H. Cushing, Harvard, 1911, fills the position made vacant by the resignation of John Clement.

POSITIONS HELD BY DAY GRADUATES.

Director of textile school,	.	.	.	.	.	.	.	2
Instructor textile or industrial school,	.	.	.	.	.	.	.	11
Mill corporation treasurer,	.	.	.	.	.	.	.	4
Mill agent,	.	.	.	.	.	.	.	5
Mill superintendent,	.	.	.	.	.	.	.	16

Mill assistant superintendent,	8
Mill assistant manager,	2
Mill foreman of department,	11
Assistant to superintendent,	5
Mill auditor and accountant,	11
Textile examiner,	2
Textile designer,	23
In commission house,	4
Electrician,	2
Draftsman,	4
Chemist and dyer,	50
In business, textile distributing or incidental thereto,	15
Other business,	23
Trade journalist,	3
Student,	2
Machinist,	2
Physical director,	1
Industrial engineer,	1
Sanitary engineer,	1
Construction engineer,	3
Master mechanic,	1
Weaver,	2
Second hand,	3
Wool houses,	3
Chemical salesman,	5
Minor mill positions,	6
Employment not known,	14
Deceased,	3
Total,	248

METHODS OF INSTRUCTION.

Instruction is first given in the principles of the sciences applicable to the textile and textile machinery industries, followed by instruction in the practical art, — the application of such sciences to the processes and machinery of manufacture.

Day instruction offers five three-year courses, and a post-graduate year. For evening instruction these are subdivided into sixteen courses. All pupils, day and evening, are presumed to enter for the final diploma at graduation, though for the evening pupil — there being but eight hours available weekly — it necessarily requires a longer time to reach the standard of acquirement than for the day pupil.

Unlike most schools the same instructors serve day and evening, thus insuring to the evening pupils from the mills and shops the same able and thorough instruction as the day pupils, for it does not necessarily follow that the humbler youth should have a poor school.

All day freshmen during the first half year receive the same general instruction. At the beginning of the second half they are expected to have chosen one of the five regular day courses. Each course, however, in addition to the specialty indicated by its name, includes some features of every other course, as such instruction, it is found, adds to the efficiency of the pupil in the line he has chosen.

While there are several regular courses offered, they may generally be grouped in three grand divisions, namely, textile engineering, chemistry and dyeing, and design.

Textile engineering includes the mechanism of all machinery used in all departments of the school, and also machine-shop practice; instruction in the creation, transmission and application of power, whether steam, hydraulic or gas. In boiler and engine testing, for which a very complete and modern laboratory is provided, the engineers and pupils are frequently called upon, or are afforded opportunities for conducting continuous twenty-four-hour tests, without intermission, of mill power plants, including the analysis of flue gases, etc. This division also includes mill construction, cements and concrete, surveying, involving the laying out of plants, shafting, etc.; physics as involved in the testing of fibers, yarns and fabrics; mechanical drawing, plans for and the construction of equipment. The pupil is first thoroughly grounded in the principles of mechanical, electrical and hydraulic engineering before attacking the more advanced and specialized problems. The higher mathematics belong to this group. Here the plans for buildings are prepared, and all construction conducted during the summer vacation by the engineers and pupils who remain for practical experience in this line of work. Instruction is by lectures, with or without models, blackboard illustrations, mathematical problems for solution, and laboratory and shop work.

Chemistry and dyeing involves a thorough course in chemistry, followed by an applied course, first in the laboratories, and finally, on commercial vats, presses, kiers, dryers, etc., in raw stock, yarns and fabrics. A special and growing branch is the making of dyes from raw minerals, vegetables, oils, etc. A special laboratory is equipped for testing coal and oil.

Design includes, first, instruction in color, conventionalizing

of nature forms, historic ornament, etc., fundamental to all branches of decorative art, and then in the application thereof to textiles. Included under this head is all fabric weaving and finishing.

Incidental to these general divisions is instruction in English, German, French and physical culture.

It has for some years been growing more and more evident that our instructors and pupils were being overworked, and that even then there was not sufficient time in a three-year course to deal as thoroughly with some specialties as was desired. A post-graduate course was established to relieve the situation, which we now wish to add as an additional year to all regular day courses. It includes more time given to present features of the curriculum and advanced work, to which is added scientific mill management, cost-finding, mill accounting, general corporation organization, commercial law and usage, patent laws and practice, principles of banking, etc., useful and essential to our graduates as they advance to positions of responsibility in the textile industry.

Most day pupils matriculate directly from the high schools or academies. So thorough is our instruction that they graduate directly into employment, and, as they rapidly advance to the higher responsibilities of the industry they need instruction that the school has lacked time to impart. Hence, in addition to the technique of the industry is included instruction incidental but essential to the positions they occupy or aspire to. At some technical schools and colleges it is sought to meet this need by recommending prescribed courses in reading after graduation, but this, being optional with the graduate, may or may not be given attention. By limiting these subjects to essentials and making them obligatory it is thought the pupils will more certainly be benefited.

The scientific method in mill management, with special reference to "efficiency or production engineering," as presented by Taylor, Gantt, Gilbreth, Gunn, Richards, Cooke, Patterson and others, mostly of the eminent Society of Mechanical Engineers, and cost-finding, are leading features of the post-graduate course, or fourth year, to be added to the three-year course of the three classes now at the school. The published works of

these engineers, or papers specially prepared by them for this school, have been furnished the fourth-year pupils, and when they are grounded in the principles of this scientific method of management they are instructed in the methods of applying them to textile processes, and are then required to pass an examination therein.

Mindful that pragmatism, as expounded by the late Professor James of Harvard, may from the standpoint of economics be summed up in this, — that a theory is valuable only as it is found useful in application, — or, more homely expressed, “the proof of the pudding is in the eating,” these papers are sent out to our graduates, already filling a great variety of positions, with the request that they use their eyes and brains and give us the benefit of their criticism and the problems they meet with from their various standpoints of supervision in practical manufacture.

Nearly all of our graduates go to positions that make it most important that they be fully instructed as to the latest improved methods of dealing with labor, and thoroughly trained as they are at the school in the make-up, installation and operation of machinery, they should be exceptionally capable of testing the various efficiency systems proposed. Papers already received from those out in employment and from their employees indicate that “efficiency or production engineering” has a useful place in the textile industry and will, when fully applied to all departments of a mill, result in as great benefits to employees and employers alike as has resulted in its application at the shop.

CORPORATION SUPERVISION.

An annual meeting is held in January for the election of officers, reception of annual reports and the transaction of such other business as may be proposed, not committed to the Board of Directors. Monthly meetings at the school, of the trustees, sitting as a Board of Directors, are provided for. They appoint such agents, school officers and teachers as they find necessary, prescribe their duties and fix their compensation. The president (in his absence the vice-president) presides at all meetings of the corporation and Board of Directors, and performs such other duties and exercises such other authority as the corpora-

tion or Board of Directors may from time to time devolve on him. The treasurer is charged with the general care of the pecuniary affairs and concerns of the corporation, he to receive all revenues and make all authorized disbursements. He is required to report receipts and expenditures and financial conditions quarterly to the Board of Directors, and annually to the corporation. He is also to execute all contracts made by express authority of the corporation or Board of Directors and approved by the president. He, with the president and one elected trustee, composes a finance committee, which passes upon all orders for expenditures and inspects all bills before payment. No expenditure can be made or liability be incurred in excess of money available to meet it except by vote of the Board of Directors at a meeting in the call for which due notice of the nature of such proposed expenditure or liability is given. The clerk is required to keep a record of all regular and special meetings of the corporation and Board of Directors, notify all members of such meetings seven days in advance, and perform such other duties as the corporation or Board of Directors may require of him. He is a resident trustee, devoting his time to the development work.

A corporation committee, of which the resident trustee is chairman, is charged with the organization and conduct of the post-graduate course.

In addition to the finance committee there are general committees of ways and means, building and legislation, and lectures. There is also a subcommittee for each department of the school, composed, as far as is practicable, of trustees identified in manufacturing with the specific branch of industry to which their department relates. They are to make recommendations to the Board of Directors as to the needs, etc., of their respective departments, and especially as to the new equipment, floor space, etc., and to perform such other duties as the directors may require of them.

The principal of the school is charged with its conduct, and is directly accountable to the Board of Directors, making monthly reports thereto, and such recommendations and special reports as to efficiency, discipline, etc., as in his judgment are required.

CONCLUSION.

An appropriation for the completion of the new boiler house, asked for last year, was not received in time to complete the building for occupancy before the opening of the fall term of 1911. While the building is under roof, the moving of the power plant has been necessarily deferred until the close of the current school year.

In building, economical methods of construction, referred to in detail in our last annual report, have not only been continued, but have even been improved upon. Our engineers have availed themselves of some of the leading features of the Taylor efficiency system, in the matter of brick laying, as set forth in "Motion Studies" by Frank B. Gilbreth, with the result that in raising 16 and 20 inch two-faced and pointed brick walls the number of brick laid daily per mason was increased about 100 per cent., or from 600 per day last year, in constructing the Colonial Avenue building, to 1,200 per day, equal quality of workmanship. The first impression will be that this increase of output must have been more exhaustive to the workman. On the contrary, when the masons were asked how they liked the new methods the reply was, "We do not get so tired this way. Last year our backs gave out by Saturday night; now they do not." The general expression was that they had an easier job, and additional compensation was not asked for.

About 125,000 light-colored concrete brick for inner facing of walls were made at the school as a cost of about \$7.50 per 1,000, as against ordinary light burned brick held at \$28 per 1,000.

Second-hand burned brick were purchased for filling between faces, delivered, at \$4.50 per 1,000, and the cost of cleaning was reduced from \$1 to 50 cents per 1,000.

Respectfully submitted,

TRUSTEES OF LOWELL TEXTILE SCHOOL,

A. G. CUMNOCK,

President.

JAMES T. SMITH,

Corporation Clerk.

LOWELL, MASS., Jan. 30, 1912.

APPENDIX.

RESIDENCE OF DAY STUDENTS.

Allerton, Mass.,	1	North Adams, Mass.,	2
Allston, Mass.,	1	North Andover, Mass.,	3
Andover, Mass.,	5	Norwood, Mass.,	2
Beachmont, Mass.,	1	Peabody, Mass.,	1
Billerica, Mass.,	2	Pittsfield, Mass.,	1
Blackstone, Mass.,	1	Reading, Mass.,	1
Boston, Mass.,	5	Revere, Mass.,	1
Bradford, Mass.,	3	Roxbury, Mass.,	1
Cambridge, Mass.,	1	Salem, Mass.,	3
Chelmsford, Mass.,	1	Saugus, Mass.,	1
Chicopee, Mass.,	1	Somerville, Mass.,	5
Clinton, Mass.,	2	South Acton, Mass.,	1
Cochituate, Mass.,	1	Springfield, Mass.,	1
Concord, Mass.,	1	Stoneham, Mass.,	3
Danvers, Mass.,	3	Uxbridge, Mass.,	1
Dorchester, Mass.,	1	Waltham, Mass.,	2
East Acton, Mass.,	1	Ward Hill, Mass.,	1
East Bridgewater, Mass.,	1	Ware, Mass.,	1
Fitchburg, Mass.,	2	Watertown, Mass.,	1
Gilbertville, Mass.,	1	West Medford, Mass.,	1
Gloucester, Mass.,	3	West Roxbury, Mass.,	1
Grafton, Mass.,	1	Wilmington, Mass.,	1
Groton, Mass.,	1	Winchester, Mass.,	4
Haverhill, Mass.,	6	Winthrop, Mass.,	1
Hingham, Mass.,	1	Connecticut,	2
Hull, Mass.,	1	Georgia,	3
Hyde Park, Mass.,	1	Maine,	7
Jamaica Plain, Mass.,	1	Michigan,	1
Lancaster, Mass.,	1	New Hampshire,	7
Lawrence, Mass.,	8	New Jersey,	2
Lexington, Mass.,	1	New York,	4
Littleton, Mass.,	1	Pennsylvania,	1
Lowell, Mass.,	18	Rhode Island,	5
Malden, Mass.,	7	Vermont,	2
Manchester, Mass.,	1	China,	1
Melrose, Mass.,	2	Japan,	1
Millville, Mass.,	1		
Newton Highlands, Mass.,	1	Total,	167

PREVIOUS EDUCATION, DAY STUDENTS.

High school or preparatory school,	142	Technical school, Japan,	1
College,	9	Rindge Manual Training School,	2
University,	5	Business college,	2
Massachusetts Institute of Technology,	3	Military academy,	1
Worcester Polytechnic Institute,	1	Grammar school,	1
		Total,	167

RESIDENCE OF EVENING STUDENTS.

Lowell, Mass.,	439	Dracut, Mass.,	3
Lawrence, Mass.,	88	Ayer, Mass.,	1
Methuen, Mass.,	25	Stoneham, Mass.,	1
Andover, Mass.,	8	Chelmsford, Mass.,	1
North Andover, Mass.,	9	Tewksbury, Mass.,	1
North Billerica, Mass.,	8	Ward Hill, Mass.,	1
North Chelmsford, Mass.,	8	West Chelmsford, Mass.,	1
Haverhill, Mass.,	6	Winthrop, Mass.,	1
Collinsville, Mass.,	5	Nashua, N. H.,	3
Forge Village, Mass.,	5		
Ballardvale, Mass.,	4	Total,	621
Boston, Mass.,	3		

PREVIOUS EDUCATION, EVENING STUDENTS.

Grammar school,	331	Massachusetts Institute of Technology,	1
High school or academy (day),	175	Business college,	16
High school (evening),	55	Military academy,	1
College or University: —		Technical school,	5
Cornell University,	1	Lawrence Industrial School,	3
Dartmouth College,	1	Textile school,	6
University of Georgia,	1	Evening drawing school,	10
Harvard University,	5	Normal school,	5
Rhode Island State College,	1	Art school,	1
Sydney University, Australia,	1		
Williams College,	2	Total,	621
— 12			

OCCUPATION OF EVENING STUDENTS.

Apprentice,	18	Dyer,	14
Assistant superintendent,	4	Electrician,	18
Beamer,	2	Engineer,	4
Blacksmith,	1	Farmer,	2
Bleacher,	1	Filling carrier,	6
Bobbin boy,	1	Finisher,	12
Bookkeeper,	4	Fireman,	2
Box maker,	2	Fixer,	9
Brick layer,	1	Foreman,	4
Broker,	1	Grinder,	1
Carder,	8	Helper,	19
Carpenter,	5	Inspector,	10
Chain builder,	2	Janitor,	2
Chauffeur,	5	Jeweler,	1
Chemist,	11	Knitter,	4
Clerk,	48	Laboratory assistant,	1
Cloth weigher,	5	Landscape gardener,	1
Designer,	2	Lathe hand,	2
Doffer,	1	Leather worker,	2
Draftsman,	10	Loom fixer,	18
Dresser,	5	Machinist,	58
Druggist,	2	Mechanic,	3

OCCUPATION OF EVENING STUDENTS — *Concluded.*

Metal worker,	6	Shoe worker,	8
Meter repairer,	4	Sorter,	4
Milkman,	1	Spare hand,	3
Not employed,	14	Speed recorder,	1
Office boy,	1	Spinner,	10
Oiler,	1	Steam fitter,	1
Operative,	54	Stenographer,	3
Overseer,	12	Stitcher,	2
Painter,	4	Student,	38
Pattern maker,	3	Superintendent,	1
Pattern weaver,	7	Surveyor,	1
Paymaster,	1	Teacher,	13
Pentagrapher,	2	Teamster,	1
Photographer,	2	Tester,	1
Polisher,	1	Third hand,	7
Primer,	1	Tinsmith,	1
Printer,	1	Twister,	2
Roll coverer,	1	Weaver,	33
Roving hand,	1	Yarn hand,	3
Salesman,	1		
Second hand,	20	Total,	621
Section hand,	18		

TOTAL RECEIPTS OF THE LOWELL TEXTILE SCHOOL FROM
ORGANIZATION TO JAN. 1, 1912.

FOR THE PLANT.

From the Commonwealth,	\$269,993 66
From other sources — manufacturers and others,	391,053 57
	<hr/>
Excess of outside contributions,	\$121,059 91

FOR MAINTENANCE.

From the Commonwealth,	\$382,500 00
From city of Lowell,	\$130,000 00
From earnings (pupils' fees),	173,773 54
	<hr/>
	303,773 54
	<hr/>
Excess of Commonwealth contributions,	\$78,726 46

AGGREGATE CONTRIBUTIONS FOR ALL PURPOSES.

From Commonwealth brought down: —

For plant,	\$269,993 66
For maintenance,	382,500 00
	<hr/>
	\$652,493 66

Total Commonwealth contribution,	\$652,493 66
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From other sources: —

For plant,	\$391,053 57
For maintenance,	303,773 54
	<hr/>
	694,827 11

Excess of outside contributions for all purposes,	\$42,333 45
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TRUSTEES OF THE LOWELL TEXTILE SCHOOL.

(Incorporated, 1895.)

HONORARY TRUSTEES.

FREDERICK FANNING AYER, Esq., New York City.

THE CORPORATION OFFICERS, 1912.

A. G. CUMNOCK, *President.*

JAMES T. SMITH, *Clerk.*

JACOB ROGERS, *Vice-President.*

A. G. POLLARD, *Treasurer.*

TRUSTEES.

On the Part of the Commonwealth of Massachusetts.

Ex officiis.

His Honor ROBERT LUCE,
Lieutenant Governor.

Dr. DAVID SNEDDEN,
Commissioner of Education.

Appointed by the Governor and Council.

FREDERICK A. FLATHER, Lowell, 1912, FRANKLIN W. HOBBS, Brookline, 1914,
Treasurer Boott Mills. Treasurer Arlington Mills.

On the Part of the City of Lowell.**Ex officiis.**

Hon. JAMES E. O'DONNELL, A. K. WHITCOMB,
Mayor of Lowell. Superintendent of Public Schools.
ANDREW E. BARRETT,
President Municipal Council.

By Appointment of the Lowell Textile Council.

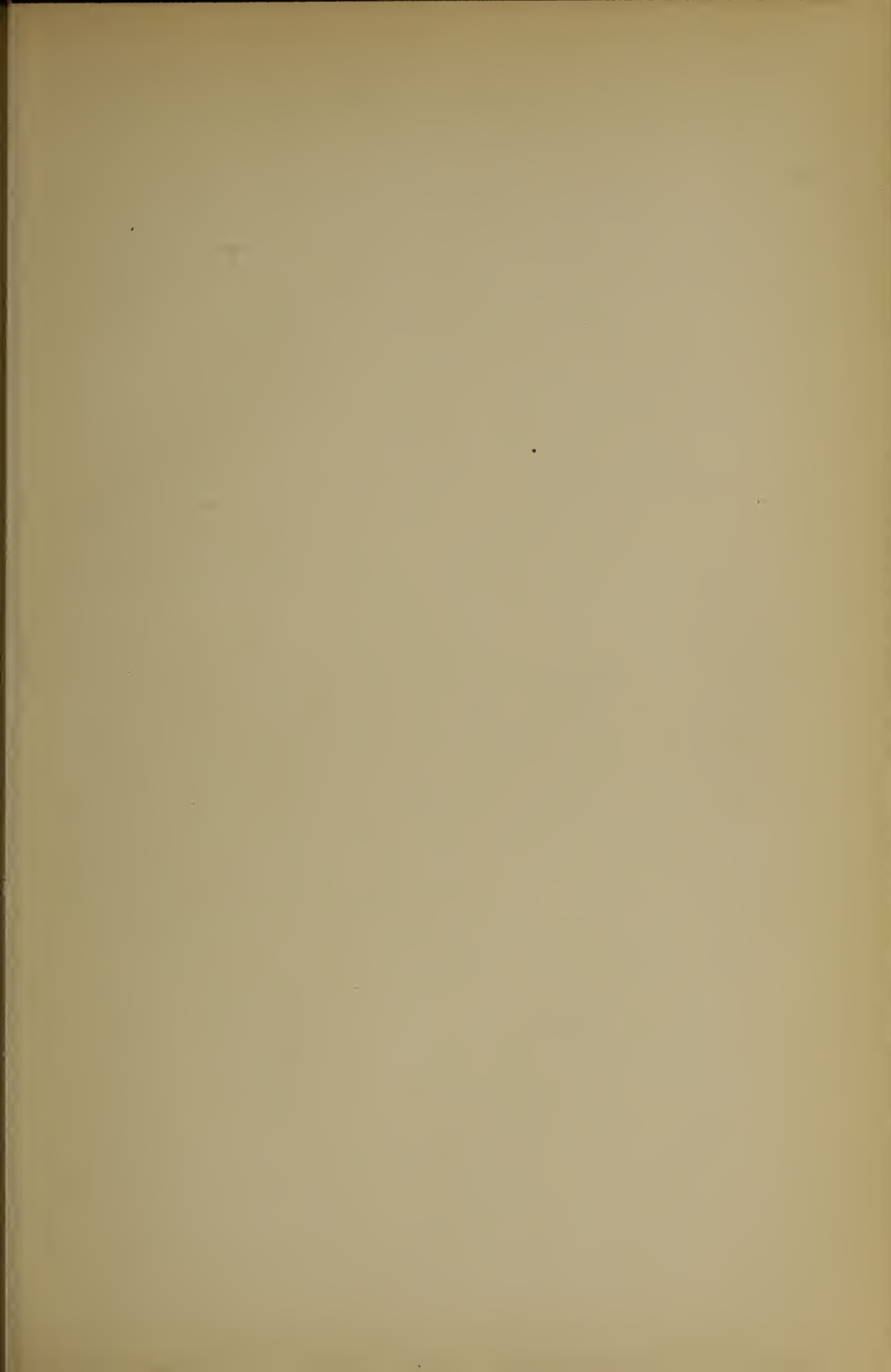
MICHAEL DUGGAN.

PERMANENT TRUSTEES.

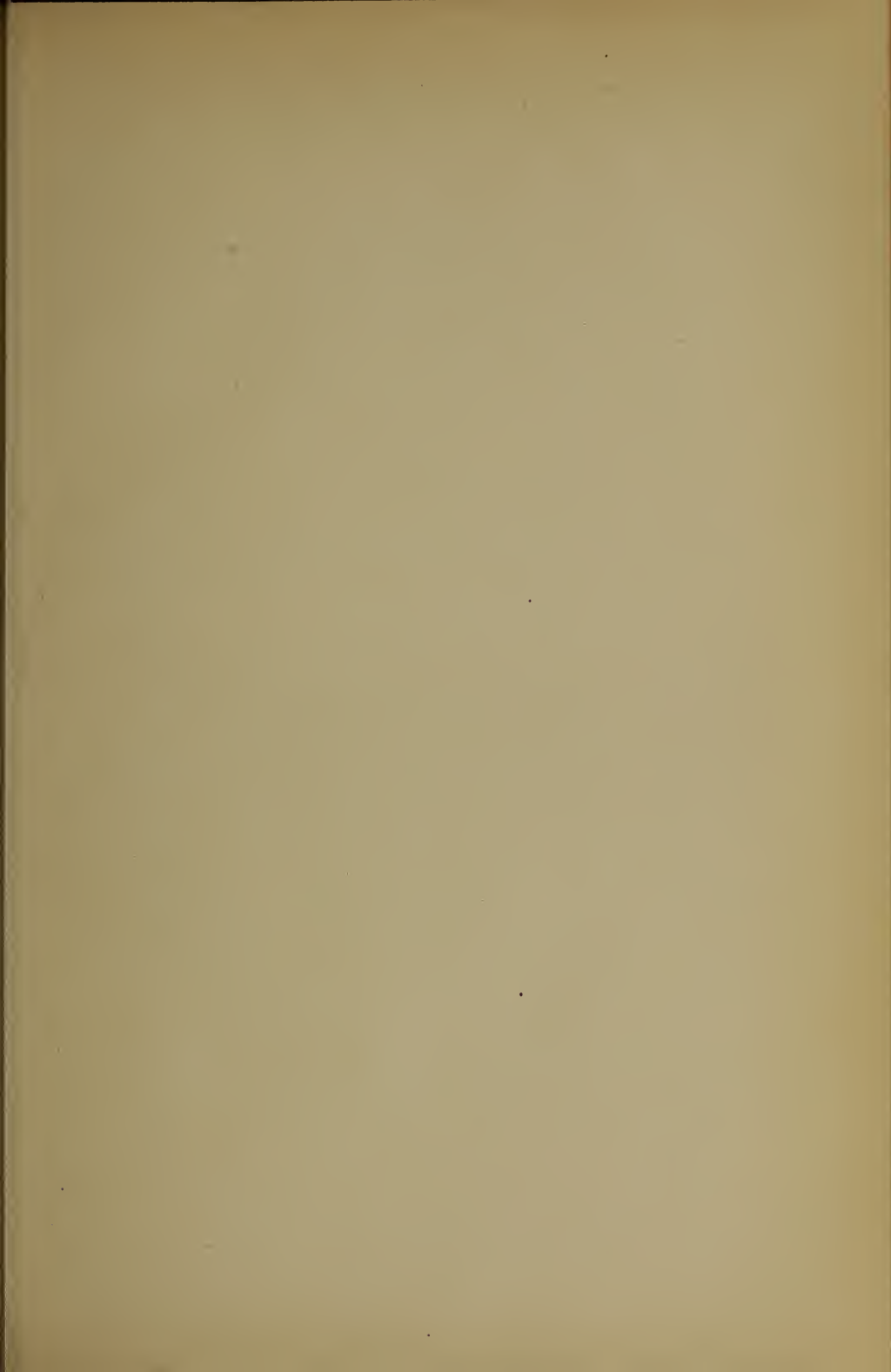
ALEXANDER G. CUMNOCK, Lowell, Treasurer, Appleton Company, Boston corporation, mills at Lowell.
EUGENE S. HYLAN, Lowell, Treasurer, New England Bunting Company.
ARTHUR G. POLLARD, Lowell, President, Lowell Hosiery Company.
FREDERICK S. CLARK, Boston and North Billerica, Treasurer, Talbot Mills.
Hon. FREDERICK LAWTON, Boston, Justice Superior Court.
JAMES T. SMITH, Lowell, Attorney at Law.
WALTER E. PARKER, Lawrence, Agent, Pacific Mills, Boston corporation, mills at Lawrence.
WILLIAM M. WOOD, Andover, President, American Woolen Company, Boston office, mills at Lawrence, Blackstone, West Fitchburg, Fitchburg, Maynard, Lowell, Plymouth, Webster, Franklin, Uxbridge.
GEORGE E. KUNHARDT, Lawrence and New York, Woolen Manufacturer.
FRANK E. DUNBAR, Lowell, Attorney at Law, and President, Appleton Company, Boston corporation, mills at Lowell.
FRANKLIN NOURSE, Lowell, late Agent, Lawrence Manufacturing Company, Boston corporation, mills at Lowell.
JACOB ROGERS, Lowell, President, Tremont and Suffolk Mills, Boston corporation, mills at Lowell.
CHARLES H. HUTCHINS, Worcester, President, Crompton and Knowles Loom Works.
HENRY A. BODWELL, Andover, Superintendent, Smith and Dove Manufacturing Company, class of 1900.
WILLIAM E. HALL, Lowell, Treasurer, Shaw Stocking Company.
WILLIAM R. MOORHOUSE, Boston, Color Chemist, Cassella Color Company, class of 1901.
CHARLES F. YOUNG, Lowell, Treasurer, Tremont and Suffolk Mills, Boston corporation, mills at Lowell.
JOHN JACOB ROGERS, Lowell, Attorney at Law.

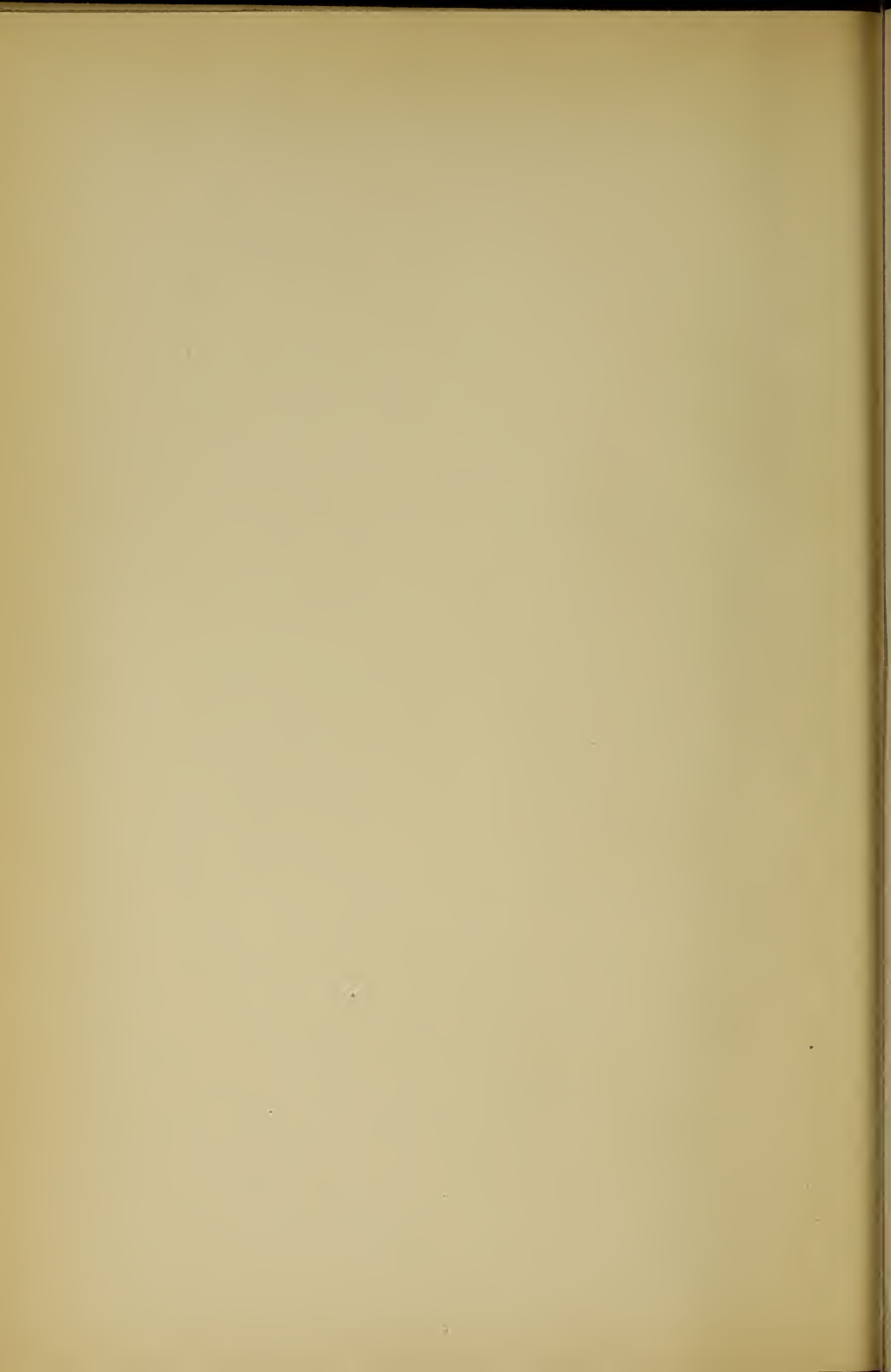
Additional Trustees elected by Alumni under Act of 1905.

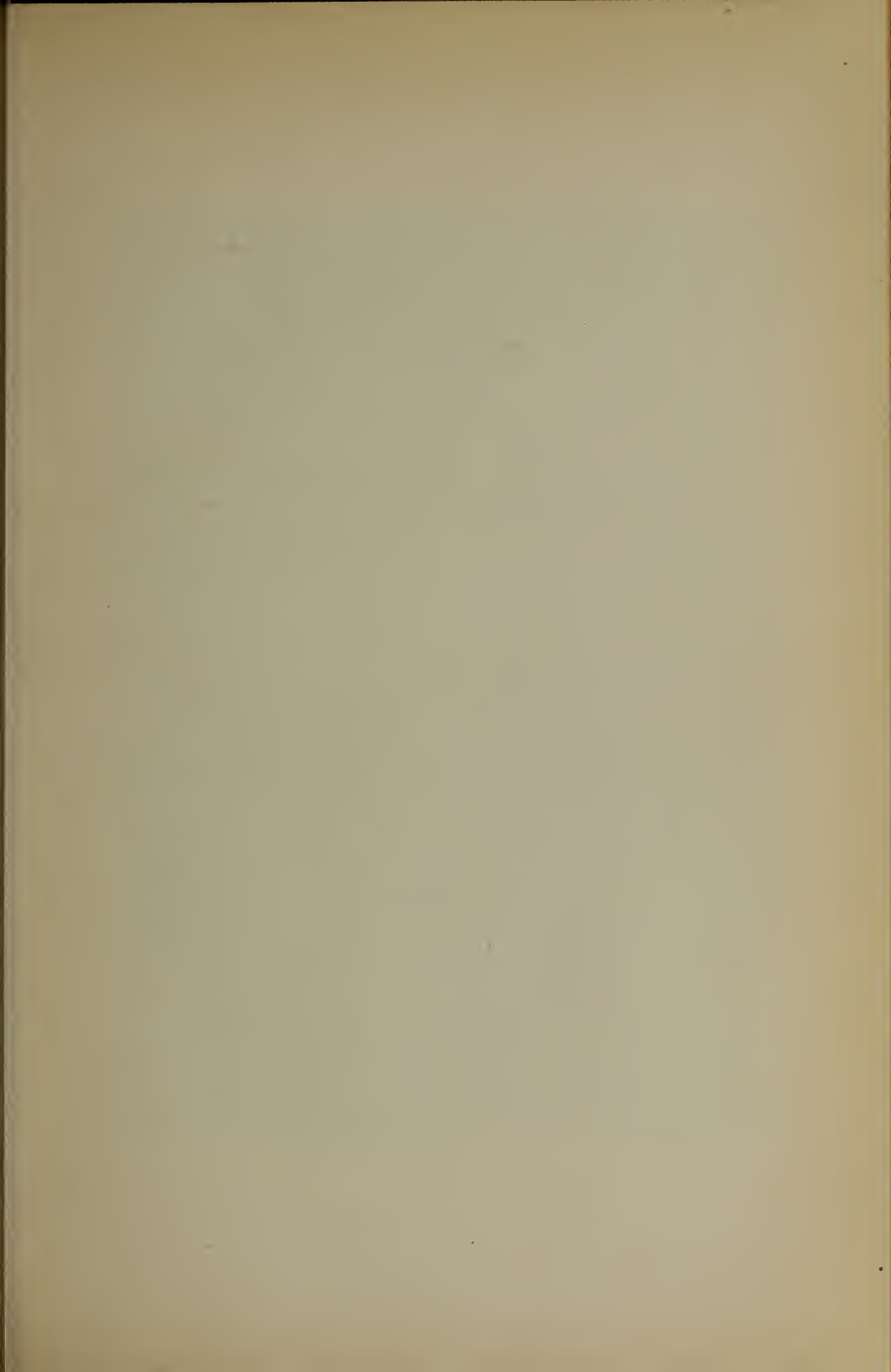
For term ending June 30, 1915: T. ELLIS RAMSDELL, class of 1902, Agent Monument Mills, Housatonic, Mass.
For term ending June 30, 1914: ROYAL P. WHITE, class of 1904, Superintendent, Stirling Mills, Lowell.
For term ending June 30, 1913: RALPH F. CULVER, class of 1904, Superintendent, Holliston Mills, Norwood, Mass.
For term ending June 30, 1912: DEXTER STEVENS, class of 1904, Yarn Superintendent, Lancaster Mills, Boston corporation, mills at Clinton, Mass.













SOUTHWICK HALL

COLONIAL AVENUE BUILDING AND
FALMOUTH STREET BUILDING

SERIES 15. NO. 4.

May, 1912

BULLETIN
OF THE
Lowell Textile School
LOWELL, MASS.

Issued Quarterly

1912-1913

Entered August 26, 1902, at Lowell, Mass., as second class matter,
under Act of Congress of July 16, 1894.

Moody Street and Colonial Avenue

CALENDAR

FOR 1912

JANUARY

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FOR 1913

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SEPTEMBER

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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30
..

OCTOBER

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5	6	7	8	9	10	11
12	13	14	15	16	17	18
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NOVEMBER

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30

DECEMBER

..	1	2	3	4	5	6
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31

CALENDAR

January—June, 1912

January 16, Tues.	Semi-annual examinations begin.
January 29, Mon.	SECOND TERM begins.
February 22, Thurs.	Washington's Birthday—Holiday.
March 2, Sat.	End of first five-week period of second term.
April 6, Sat.	End of second five-week period of second term.
April 18, Thurs. to April 20, Sat. inclusive	Recess.
April 24, Wed.	Certificates awarded to Evening Graduates.
May 16, Thurs.	Final examinations begin.
May 30, Thurs.	Memorial Day—Holiday.
June 7, Fri.	Diplomas awarded to Day Graduates.
June 18 and 19, Tues. and Wed. 9 A. M.	First entrance examinations.

September, 1912—June, 1913

September 10 and 11, Tues. and Wed. 9 A. M.	Second entrance examinations.
September 13, Fri.—9 A. M.	Re-examinations and examinations for ad- vanced standing begin.
September 24, Tues.	DAY SCHOOL YEAR begins.
September 26, Thurs.—7 P.M.	Entrance examinations for evening students begin. They will be held on Thursday evenings until opening of classes.
October 12, Sat.	Columbus Day—Holiday.
October 14, Mon.	Evening school year begins.
October 26, Sat.	End of first five-week period of first term.
November 27, Wed. to No- vember 30, Sat. inclusive	Thanksgiving Recess.
November 30, Sat.	End of second five-week period of first term.
December 23, Mon. to Janu- ary 2, Thurs. inclusive	Christmas Recess.
January 14, Tues.	Semi-annual examinations begin.
January 27, Mon.	SECOND TERM begins.
February 22, Sat.	Washington's Birthday—Holiday.
March 1, Sat.	End of first five-week period of second term.
April 5, Sat.	End of second five-week period of second term.
April 17, Thurs. to April 19, Sat. inclusive	Recess.
April 23, Wed.	Certificates awarded to Evening Graduates.
May 15, Thurs.	Final examinations begin.
May 30, Fri.	Memorial Day—Holiday.
June 6, Fri.	Diplomas awarded to Day Graduates.
June 17 and 18, Tues. and Wed. 9 A. M.	First entrance examinations.

September, 1913—January, 1914

September 9 and 10, Tues. and Wed. 9 A. M.	Second entrance examinations.
September 12, Fri.—9 A. M.	Re-examinations and examinations for ad- vanced standing begin.
September 23, Tues.	DAY SCHOOL YEAR begins.
September 25, Thurs. 7 P. M.	Entrance examinations for evening students begin. They will be held on Thursday evenings until opening of classes.
October 13, Mon.	Holiday in observance of Columbus Day.
October 14, Tues.	Evening school year begins.
October 25, Sat.	End of first five-week period of first term.
November 26, Wed. to No- vember 29, Sat. inclusive	Thanksgiving Recess.
November 29, Sat.	End of second five-week period of first term.
December 23, Tues. to Janu- ary 2, Fri. inclusive	Christmas Recess.



SOUTHWICK HALL

KITSON HALL AND CAMPUS

Trustees of the Lowell Textile School

(Incorporated 1895)

Honorary Trustee

FREDERICK FANNING AYER,
New York City

The Corporation

Officers, 1912

ALEXANDER G. CUMNOCK, President JAMES T. SMITH, Clerk
JACOB ROGERS, Vice-President ARTHUR G. POLLARD, Treasurer

Trustees

On the part of the Commonwealth of Massachusetts

Ex Officiis

HIS HONOR ROBERT LUCE
Lieutenant Governor

DR. DAVID SNEDDEN
Commissioner of Education

Appointed by the Governor and Council

FREDERICK A. FLATHER, Lowell, 1912 FRANKLIN W. HOBBS, Brookline, 1914
Treasurer Boott Mills Treasurer Arlington Mills

On the part of the City of Lowell

Ex Officiis

HON. JAMES E. O'DONNELL
Mayor of Lowell

ARTHUR K. WHITCOMB
Superintendent of Public Schools

ANDREW E. BARRETT

President Municipal Council

By Appointment of the Lowell Textile Council

MICHAEL DUGGAN

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FREDERIC S. CLARK, Boston and North Billerica, Treasurer, Talbot Mills.
HON. FREDERICK LAWTON, Boston, Justice Superior Court.
JAMES T. SMITH, Lowell, Attorney-at-law.
WALTER E. PARKER, Lawrence, Agent, Pacific Mills, Boston Corporation, Mills at Lawrence.
WILLIAM M. WOOD, Andover, President, American Woolen Company, Boston Office, Mills at Lawrence, Blackstone, West Fitchburg, Fitchburg, Maynard, Lowell, Plymouth, Webster, Franklin, Uxbridge.
GEORGE E. KUNHARDT, Lawrence and New York, Woolen Manufacturer.
FRANK E. DUNBAR, Lowell, Attorney-at-law, and President, Appleton Company, Boston Corporation, Mills at Lowell.
FRANKLIN NOURSE, Lowell, Late Agent, Lawrence Manufacturing Company, Boston Corporation, Mills at Lowell.
JACOB ROGERS, Lowell, President, Tremont & Suffolk Mills, Boston Corporation, Mills at Lowell.
CHARLES H. HUTCHINS, Worcester, President, Crompton and Knowles Loom Works.
HENRY A. BODWELL, Andover, Superintendent, Smith and Dove Manufacturing Company. Class of 1900.
WILLIAM E. HALL, Lowell, Treasurer, Shaw Stocking Company.
WILLIAM R. MOORHOUSE, Boston, Color Chemist, Cassella Color Company. Class of 1901.
CHARLES F. YOUNG, Lowell, Treasurer, Tremont and Suffolk Mills, Boston Corporation, Mills at Lowell.
JOHN JACOB ROGERS, Lowell, Attorney-at-law.

Additional Trustees Elected by Alumni Under Act of 1905

For Term Ending June 30, 1915:

T. ELLIS RAMSDELL, Class of 1902, Agent, Monument Mills, Housatonic, Mass.

For Term Ending June 30, 1914:

ROYAL P. WHITE, Class of 1904, Superintendent, Stirling Mills, Lowell.

For Term Ending June 30, 1913:

RALPH F. CULVER, class of 1904, Superintendent, Holliston Mills, Norwood, Mass.

For Term Ending June 30, 1912:

DEXTER STEVENS, Class of 1904, Yarn Superintendent, Lancaster Mills, Boston Corporation, Mills at Clinton, Mass.



GENERAL VIEW OF SCHOOL, MERRIMACK RIVER

GENERAL COMMITTEES

FINANCE

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ALEXANDER G. CUMNOCK, Chairman

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	FRANKLIN NOURSE	

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ROYAL P. WHITE	

LECTURES

FRANKLIN NOURSE, Chairman	HENRY A. BODWELL
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JOHN J. ROGERS	FREDERIC S. CLARK

DEPARTMENT COMMITTEES

Cotton Spinning

FRANKLIN NOURSE, Chairman	WILLIAM E. HALL
T. ELLIS RAMSDELL	DEXTER STEVENS

Woolen and Worsted Spinning

FRANKLIN W. HOBBS, Chairman	FREDERICK A. FLATHER
WALTER E. PARKER	

Chemistry and Dyeing

WILLIAM R. MOORHOUSE, Chairman	FREDERIC S. CLARK
RALPH F. CULVER	

Decorative Art

JAMES T. SMITH, Chairman	FREDERICK LAWTON
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Designing, Weaving and Finishing

FREDERIC S. CLARK, Chairman	ROYAL P. WHITE
DEXTER STEVENS	

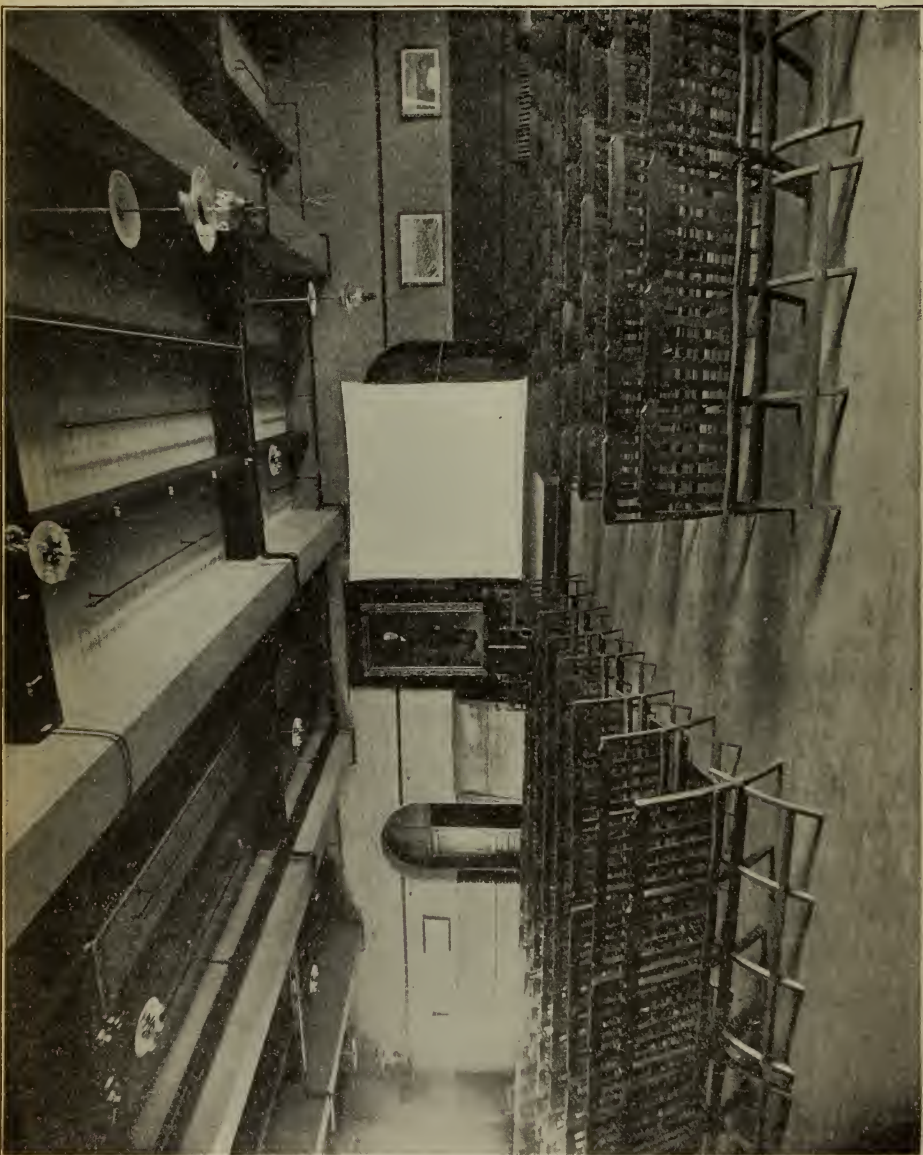
Mechanical and Electrical Engineering

HENRY A. BODWELL, Chairman	FRANKLIN NOURSE
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Athletics

JAMES T. SMITH, Chairman	
WILLIAM R. MOORHOUSE	ROYAL P. WHITE

ASSEMBLY HALL



INSTRUCTION STAFF

ADMINISTRATION

CHARLES H. EAMES, S. B., Principal of the School

WALTER B. HOLT, Bursar

GRACE PEARSON, Registrar

CECELIA A. SMALL, Secretary

FLORENCE M. LANCEY, Librarian

Chiefs of Departments

LOUIS A. OLNEY, A. C., M. S.,

Professor of Chemistry; in charge of Department of
Chemistry and Dyeing

EDGAR H. BARKER,

In charge of Department of Woolen and Worsted
Yarns

GEORGE H. PERKINS, S. B.,

In charge of Department of Textile Engineering

ARTHUR A. STEWART,

In charge of Department of Finishing

STEPHEN E. SMITH,

In charge of Department of Cotton Yarns and
Knitting

HERMANN H. BACHMANN,

In charge of Department of Textile Design and Power
Weaving

Instructors

JOSEPH WILMOT,

Instructor in Power Weaving and Warp Preparation

JOHN N. HOWKER,

Instructor in Wool Sorting and Scouring

STEWART MACKAY,

Instructor in Textile Design and Cloth Analysis

ROBERT R. SLEEPER,

Instructor in Dyeing

HERBERT J. BALL, S. B.,

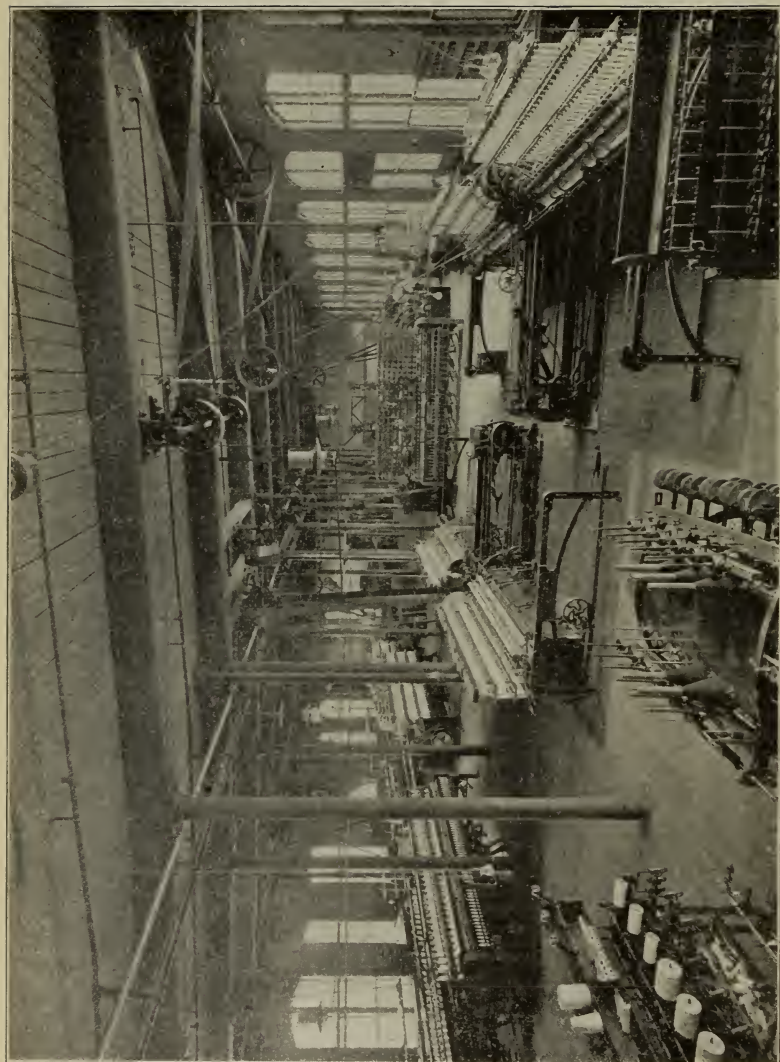
Instructor in Mechanical Engineering

EUGENE C. WOODCOCK,

Instructor in Woolen and Worsted Yarns

E. ELIZABETH WHITNEY,

Instructor in Freehand Drawing



COTTON YARN DEPARTMENT

Instructors—Continued

- ULYSSES J. LUPIN, S. B.,
Instructor in Mathematics, Physics and Electrical
Engineering
- MILES R. MOFFATT, S. B.,
Instructor in Chemistry
- HOWARD D. SMITH, PH. D.,
Instructor in Chemistry
- REGINALD S. BOEHNER, M.Sc.,
Instructor in Chemistry
- ALBERT E. MUSARD,
Instructor in Jacquard Weaving
- JOHN C. LOWE,
Instructor in Woolen and Worsted Yarns
- HERBERT C. WOOD,
Instructor in Cotton Yarns
- WALTER E. HADLEY,
Instructor in Chemistry
- LESTER H. CUSHING, A. B.,
Instructor in Commercial Languages, English and
History
- CHARLES H. JACK,
Instructor in Machine Shop Practice
- HENRY K. DICK,
Instructor in Knitting
- RALPH E. GUILLOW,
Instructor in Physical Culture
- STARR H. FISKE,
Assistant Instructor in Weaving
- ROBERT KIRKPATRICK, A.B.,
Assistant Instructor in Chemistry
- ERNEST J. BATTY, S. B.,
Assistant Instructor in Mechanical Drawing
- JOHN C. STANDISH,
Assistant Instructor in Dyeing
- ARCHIBALD R. GARDNER, M. D.,
Medical Adviser

Faculty

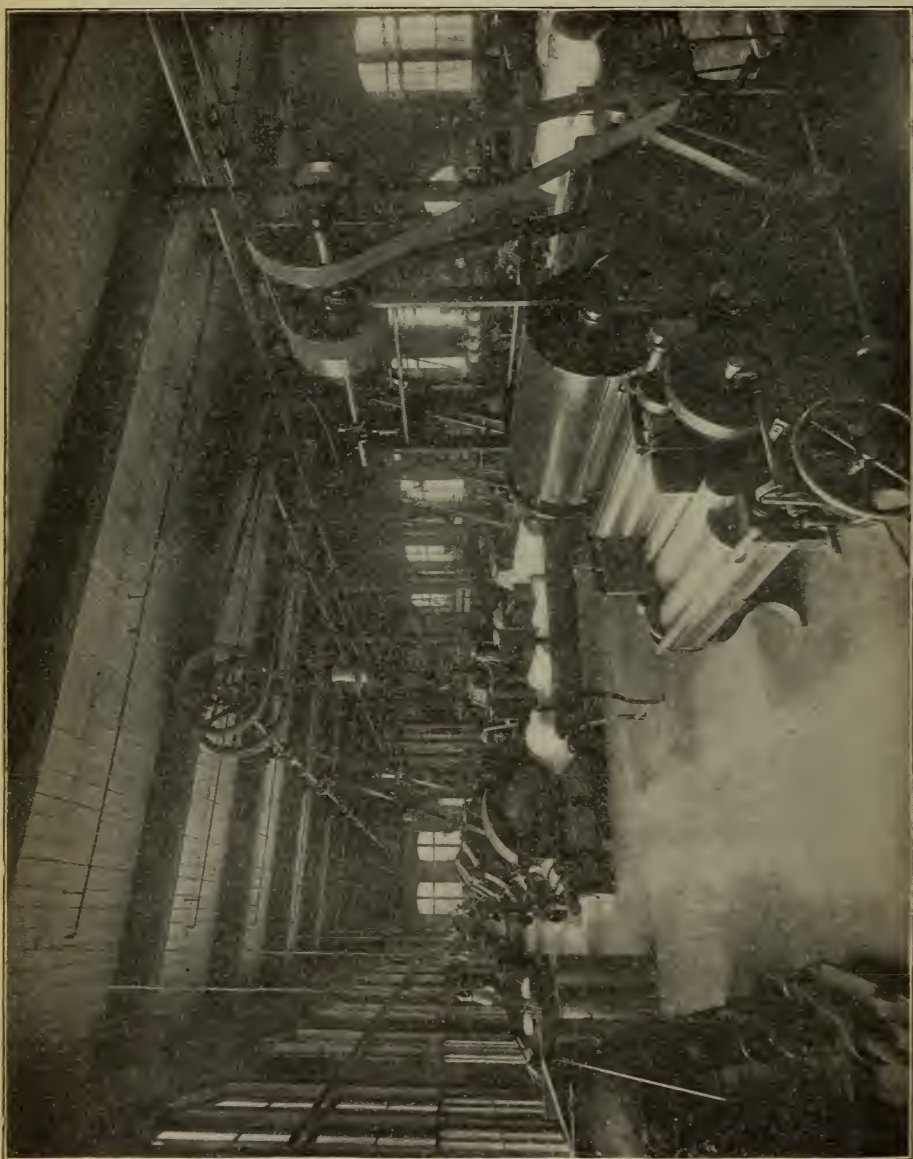
CHARLES H. EAMES

LOUIS A. OLNEY
EDGAR H. BARKER
GEORGE H. PERKINS

STEPHEN E. SMITH
ARTHUR A. STEWART
HERMANN H. BACHMANN

PICKING AND CARDING

COTTON YARN DEPARTMENT



The Lowell Textile School

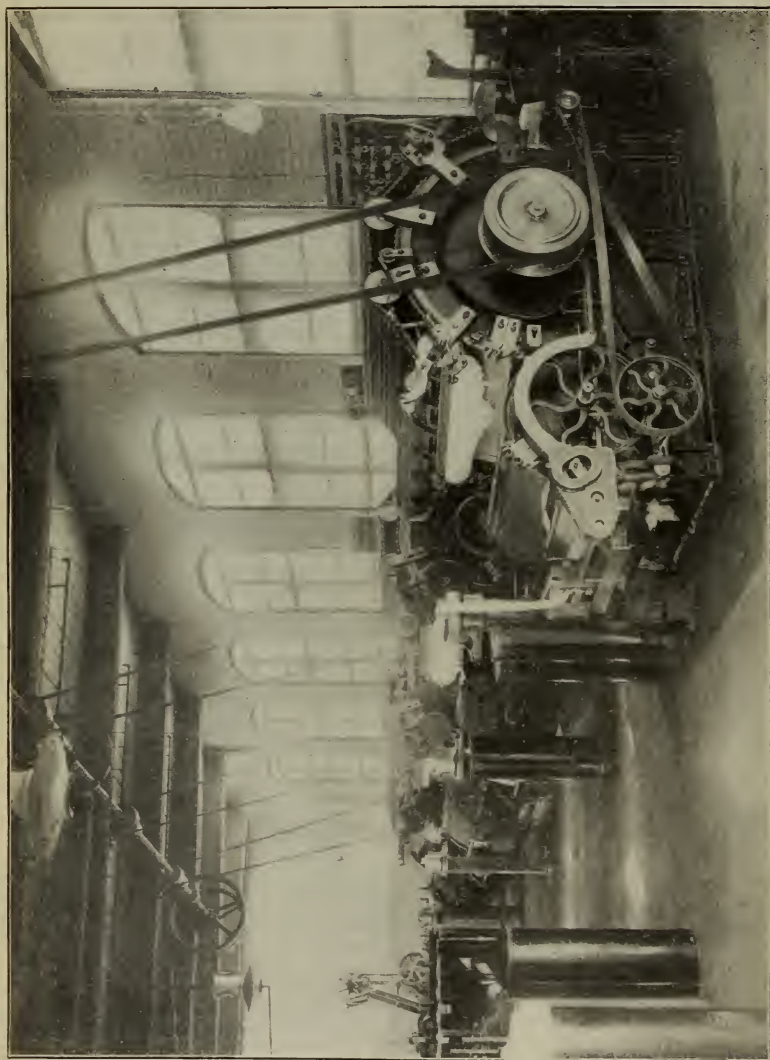
The Lowell Textile School was established, and is managed, by the Trustees of the Lowell Textile School of Lowell, Massachusetts, "for the purpose of instruction in the theory and practical art of textile and kindred branches of industry," as set forth in the act of incorporation.

The movement for the establishment of the School dates from June 1, 1891, but it was not opened for instruction until February 1, 1897.

Not only did the normal progress of the textile industry require such a school, but through the rapid development of the manufacture of the coarser cotton fabrics in the southern states, a crisis had arrived in the leading industry of New England which could only be met by wider and more thorough application of the sciences and arts for the production of finer and more varied fabrics.

Modeled on the lines of the departments of the higher Polytechnic Institutes, it offers thorough instruction in the elements and principles of the sciences and arts applicable to textile and kindred branches of industry and also in their application to the manufacturing of all varieties of textile fabrics, and the machinery required therefor.

In industrial education the distinction between Trade and Technical Industrial Schools is coming to be understood. The Lowell School belongs to the latter class. Beginning with limited equipment, instructing staff, and means, instruction at first was by Mill or Trade school methods—the pupil was brought directly to the machine, its parts explained to him, and its operation in manufacturing. The curriculum was, however, rapidly extended, as contemplated in the original plan, department after department opened and equipped, and commodious and well adapted buildings provided for a permanent home.



COTTON CARDING

While the progress of invention and the demands of ever changing markets will compel constant improvement in methods and additions to the very extensive equipment, the period of establishment is substantially closed. All departments are open for instruction in all branches of the textile art under extensive and able corps of instructors and assistant instructors.

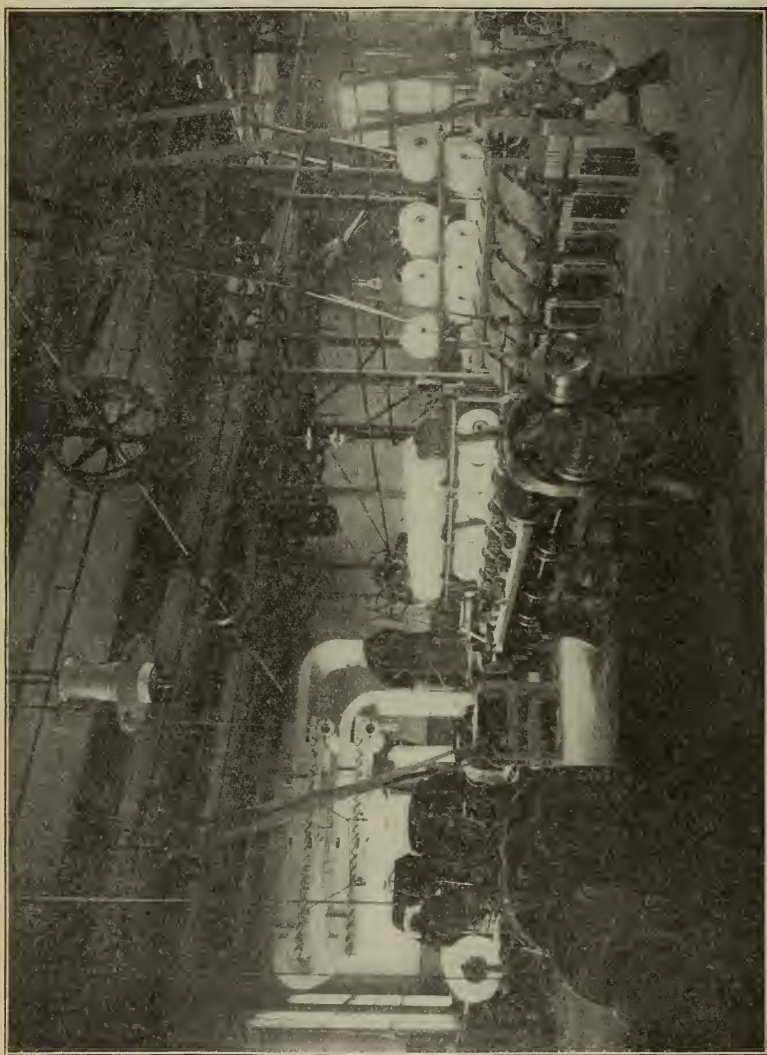
Of the incorporators the permanent trustees (limited to twenty) are mainly representatives, as president, treasurer, agent, or superintendent, of the management of great textile or textile machine corporations of the Commonwealth, and associated with them are, *ex officio*, His Honor, the Lieutenant Governor and the Commissioner of the State Board of Education, and two trustees appointed for four-year terms by the Governor and Council. Also the Mayor, the President of the Municipal Council, the Superintendent of Schools, and a representative of the textile council of the city of Lowell. At the session of 1905 the Legislature authorized the graduates of the school to elect two additional trustees, and by an act of 1906 the number was increased to four for four-year terms, one being elected each year.

By the terms of the by-laws at least three-fourths of the permanent trustees must be persons "actually engaged in or connected with textile or kindred manufactures."

Lowell, Massachusetts is called the "Mother Textile City of America," and in locating the school at this center a considerable advantage is secured for the reason that every commercial fibre is utilized in the products of the great Merrimack Valley Textile district. The practical work of the school is therefore kept closely in touch with the several branches of the industry which are included in the courses of study.

His Excellency, Governor Roger Wolcott, formally opened the school on January 30, 1897, there being present a large and representative gathering of men from the textile industries in all portions of New England. The regular classes of the school were opened on February 1, 1897, and have been regularly conducted since that time.

His Excellency, Governor John L. Bates, dedicated the buildings forming the permanent home of the school on February 12,



COTTON COMBING

1903, in the presence of a large number of guests representing the Legislature as well as the educational, textile, and commercial interests of the Commonwealth.

The day classes have been organized for those who can devote their entire time for three or more years to the instruction requisite in preparing to enter the textile industries. It has been found necessary to require of all such students educational qualifications equivalent to those given by a regular four year course of a high school or academy of good standing.

For those who are unable to attend the day courses classes are held for about twenty weeks of the year in the evening. The courses then given are similar to those of the day, but are aimed especially to meet the needs of those working during the day in the mills and shops. For entrance to these classes an applicant should have the equivalent of a grammar school education.

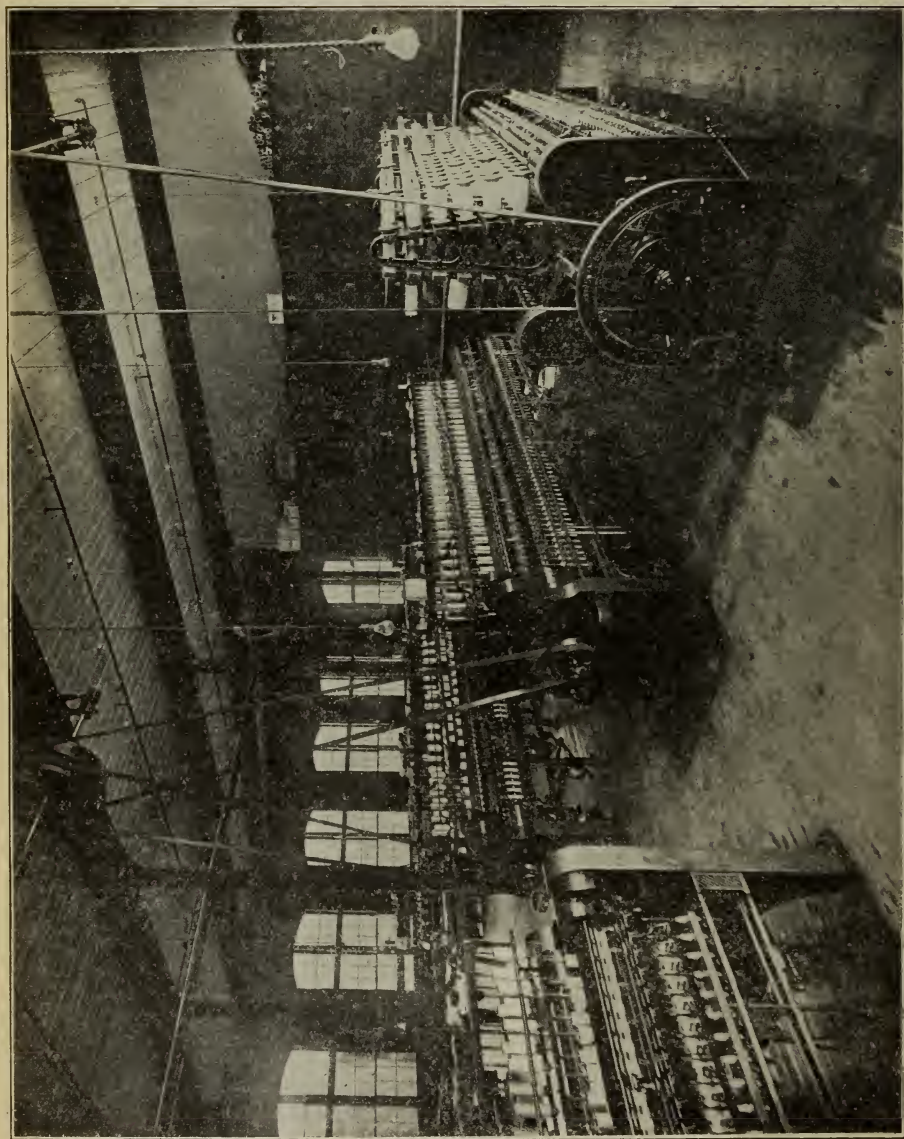
The school has so advanced in the standard and character of its work, as well as the standard for admission to its day classes, that upon application to the Legislature of the State of Massachusetts permission was given to the school to grant the degrees of Bachelor of Textile Engineering (B. T. E.) and Bachelor of Textile Dyeing (B. T. D.) upon the satisfactory completion of prescribed four year courses.

The mechanical equipment of the school includes the best makes of textile machinery, and these machines, while built as they would be for regular work, are, as far as possible, adapted to the experimental work which is of particular value in such an institution as this.

There is a more varied equipment in this school than in any other, either in America or Europe, and it is now possible to convert the raw stock into the finished fabric, within the school.

The growth of the school has been constant, as is evident from the fact that when it was opened February 1, 1897, there were 32 day and 110 evening pupils. January 1, 1912, the roster showed 167 day pupils and 621 evening pupils or 788 in all.

On January 1, 1903, the School was transferred from the rented quarters that it had occupied for five years to the site and buildings where it is permanently located.



COTTON SPINNING AND TWISTING

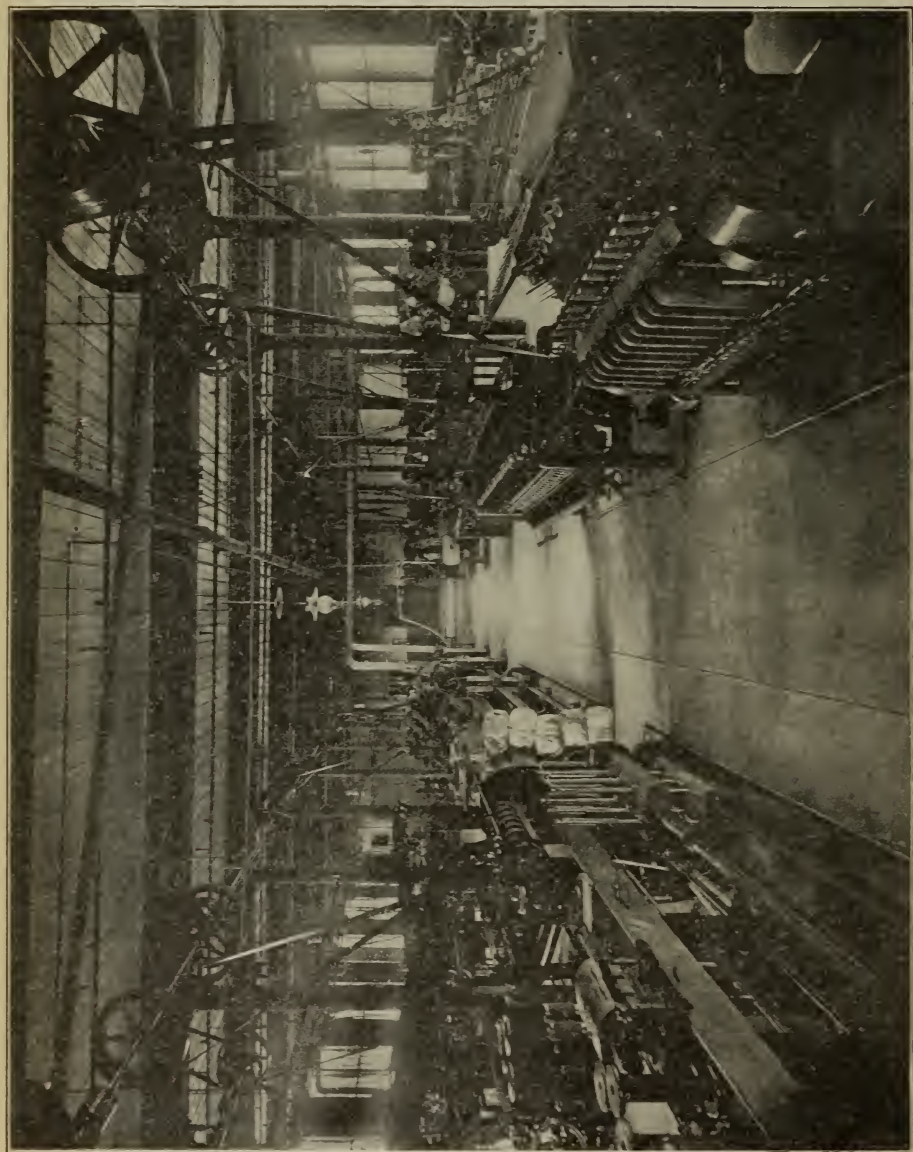
The site is a commanding one, consisting of about fifteen acres at a high elevation, on the west bank of the Merrimack River, extending to and overlooking the rapids of Pawtucket Falls, the first to be utilized for power weaving in America on an extensive scale. This site was contributed by Frederick Fanning Ayer, Esquire, of New York City, and the Proprietors of the Locks and Canals on the Merrimack River. The buildings consist of Southwick Hall, Kitson Hall, the Falmouth Street Building and Colonial Avenue Laboratories, with a power plant east of the Falmouth Street Building.

Southwick Hall was contributed by the Commonwealth of Massachusetts and Frederick Fanning Ayer, Esquire, of New York City, and is a memorial to Royal Southwick, a leading textile manufacturer, a public man of earlier days, and a maternal ancestor of Mr. Ayer. It includes a central mass 90 x 90 ft., having three stories and two wings 80 x 85 ft. with two stories and a well lighted basement. The building is pierced in the center by an arched way from which access is had to the wings and to the central courtyard. The northern wing is occupied by the General Offices, Engineering and Finishing Departments, and Library, while the southern wing is entirely occupied by the Chemistry and Dyeing Departments. In the basement is located an Industrial Chemistry Laboratory for the manufacture of dyes from the crude material.

Kitson Hall, dedicated to the memory of Richard Kitson, was contributed by Charlotte P. Kitson and Emma K. Stott, his daughters; the Kitson Machine Company of Lowell, founded by Mr. Kitson, was also a generous contributor.

This hall makes a right angle with Southwick Hall, is 60 feet by 252 feet and has one story and a basement. The first floor is occupied by the Cotton Yarn and Knitting Departments, while the basement contains the Mechanical Engineering Laboratory, Machine Shop, also Students' Locker and Recreation Rooms.

Since the erection of this building the northeast portion has been occupied by the power and heating plant, but during the coming summer it is proposed to move this into the new building recently erected in the rear of the school buildings.



WOOLEN AND WORSTED YARN DEPARTMENT

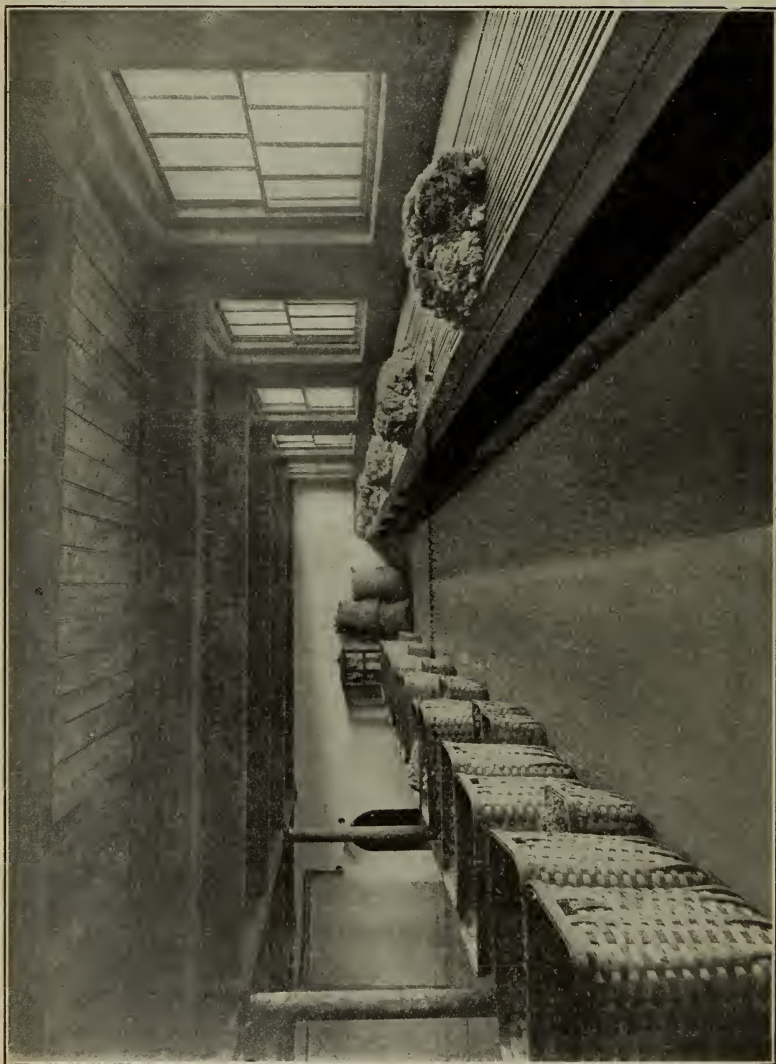
The Falmouth Street Building forms the third side of the quadrangle and consists of two portions, one 75 x 130 ft., three stories, and the head house 70 x 80 ft., three stories and basement. One portion of this building is occupied by the Departments of Weaving and Woolen and Worsted Yarns; the other, the head house, also is occupied by these departments, and contains equipment for French Spinning, Warp Preparation, Wool Scouring, Carbonizing and Conditioning; the upper floor contains the Textile Design Department. This building was erected by funds given by the Commonwealth and a private donor.

Colonial Avenue Building was erected in the summer of 1910 from plans prepared by the Engineering Department. The work of construction was also in charge of the engineers of this department. The building completes the fourth side of the quadrangle and in outward appearance corresponds to the architectural features of the other school buildings. It is a single story building and has the dimensions of 195 x 60 ft. Its interior is faced with cement brick made at the school during the progress of the work. These serve to give light reflecting walls which are advantageous for the work of the Wool Manufacturing and Chemistry and Dyeing Departments that occupy this building. The funds for this building were provided by the state of Massachusetts.

The buildings are all faced on the exterior with light brick with granite and Indiana limestone trimmings.¹ They are of modern mill construction adapted to educational uses. The floor space of the several departments is as follows:

Cotton Yarns and Knitting	12,000 sq. ft.
Woolen and Worsted Yarns	28,160 " "
Textile Design and Decorative Art	16,806 " "
General Chemistry and Dyeing Laboratories	28,400 " "
Finishing	5,806 " "
Power Weaving	15,360 " "
Textile Engineering	15,729 " "
Power Plant	5,000 " "
Physical Culture	7,200 " "

The additional floor space is devoted to Administration Offices, Library, Assembly Halls, Class Rooms, Store Rooms, etc.



WOOL SORTING

Though from the first the management has kept in view the clearly defined objective which called for the establishment of the school, namely, the needs of the textile and kindred industries, it has developed its curriculum, its instruction methods, and equipment as those needs arose or became evident. At this writing its chemical and dyeing, decorative art, design, yarn and weaving departments are liberally housed, equipped, and provided with able instructors for the highest efficiency, though additional floor space is required and is being provided as the roster of pupils increases. The demand for a very large addition to the mechanical, machine shop, and power production and application branches embraced by the title "Textile Engineering" was supplied in 1908. Within the last two years large additions of floor space have been made to the Design Department, the Woolen and Worsted, and the Chemistry and Dyeing Laboratories.

EQUIPMENT

The equipment of machinery, inventoried January 1, 1912, at \$235,595.53, is most varied for textile educational purposes, and is being constantly augmented. The builders of the various machines installed keep in close touch with the school, adding to the machines such improvements as are made from time to time, and each year some new machine will be added by a manufacturer who finds it to his advantage to be represented here. This operates to mutual advantage of student and manufacturer.

COTTON DEPARTMENT

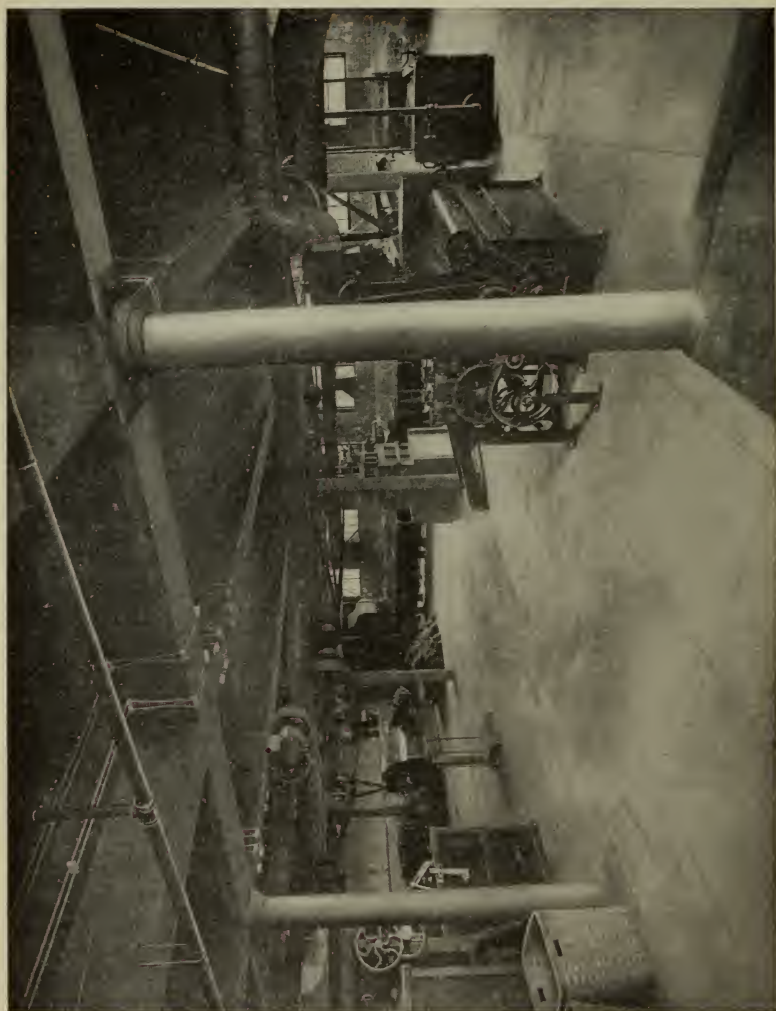
Ginning

- One 50 saw gin made by Daniel Pratt Gin Co., Prattsville, Ala.
- One Prior Roller Gin.

Opening, Picking and Waste Machinery

An outfit of Kitson Picking Machinery from works of Kitson Machine Co., Lowell, Mass., including:

- One No. 7 Opener with Automatic Feeder connected by Perham patent Cleaning Trunk to
- One 40 in. Single Beater Breaker Lapper with Condenser and gauge box feed.
- One 40 in. Single Beater Intermediate Finisher Lapper with Perham & Davis Sectional Plate Evener, apron to double four laps.



WOOL SCOURING AND CARBONIZING

One 40 in. Single Beater Finisher Lapper with Perham & Davis Sectional Plate Eveners, apron to double four laps, Kirschner Patent Carding Beater.

One Roving Waste Opener.

One Thread Extractor.

Carding, Combing and Drawing

The following machinery made by the Lowell Machine Shop, Lowell, Mass.

One Top Flat Card.

Three Revolving Flat Cards.

Two Railway Heads.

Two Drawing Frames.

One of these cards is equipped with the Chapman Electric Neutralizer, made by the Chapman Electric Neutralizer Co., Portland, Me.

From Kitson Machine Company

Stripping Rolls, etc.

From the Whitin Machine Works, Whitinsville, Mass.

One 40 in. Revolving Flat Card.

Card Grinding Rolls.

One Sliver Lapper.

One Six Head Ribbon Lapper.

One Four Head Ribbon Lapper.

One Six Head Comber.

One Eight Head High Speed Comber.

From the Mason Machine Works, Taunton, Mass.

One Sliver Lap Machine.

One Comber.

Roving, Spinning and Twisting

From Lowell Machine Shop, Lowell, Mass.

One Slubber.

One Intermediate.

One Fine Frame.

One Jack Frame.

Three Ring Spinning Frames.

One Spinning Mule.

One Spooler.

One Wet and Dry Twister.

From Fales & Jenks, Pawtucket, R. I.

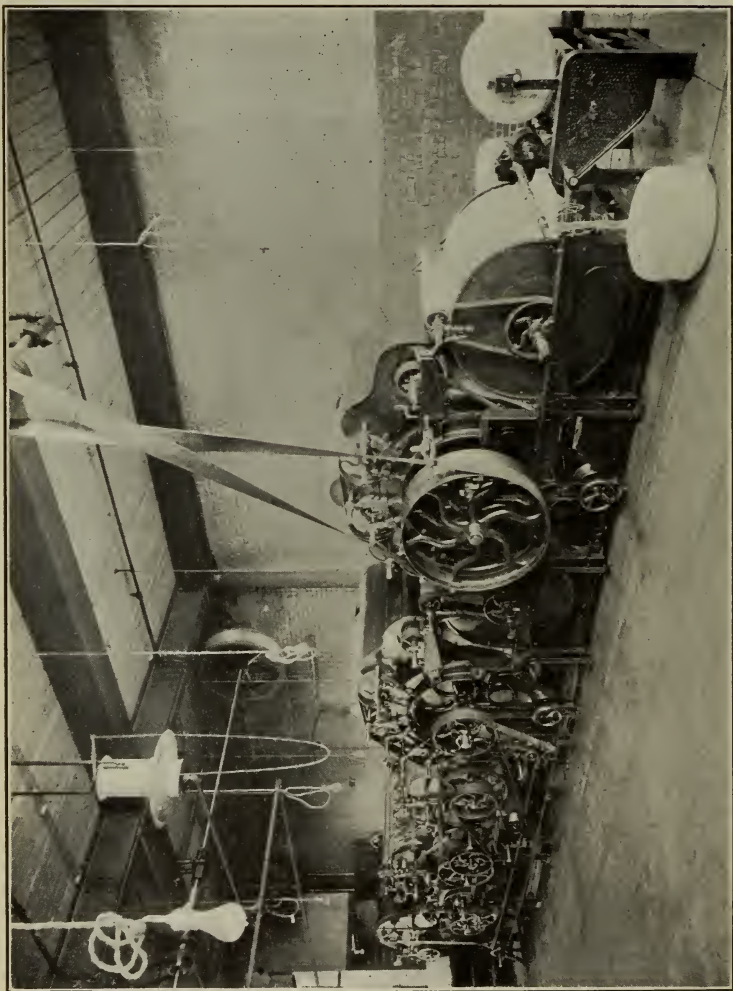
One Wet and Dry Twister.

From Draper Company, Hopedale, Mass.

One Wet and Dry Twister.

From Whitin Machine Works, Whitinsville, Mass.

Two Ring Spinning Frames.



WORSTED CARD

From Woonsocket Machine and Press Co., Woonsocket, R. I.

One Intermediate Fly Frame.

From Asa Lees Co., Oldham, England, Wm. Firth Company, Agents.

One Mule for fine spinning.

Miscellaneous Machinery of this Department includes:

From the Lowell Machine Shop, Lowell, Mass.

One Reel.

One Model Fine Fly Frame.

One Model Fly Frame Compound.

One Model Card Feed.

One Model Flat Grinding Device.

One Model Scroll Setting Device.

From The Universal Winding Company, Providence, R. I.

One Six Head Universal Winder, for cones, tubes or multiple winding.

From George W. Payne Co., Pawtucket, R. I.

One 12 Spindle Cone Winder.

From Draper Company, Hopedale, Mass.

One Weeks Banding Machine.

One Moscrop Single Thread Testing Machine.

Miscellaneous Machines.

One Yarn Inspection Machine with blackboards.

Two Barbour Knotters.

Two Yarn Reels and Grain Scales.

One Power Yarn Tester.

One Twist Counter.

From Howard Brothers, Worcester, Mass.

One Exhibition Board of Hand Cards.

One Exhibition Board of Card Clothing.

Knitting Department

One Mayo "Acme" Full Automatic Seamless Knitting Machine from Mayo Knitting Machine and Needle Co., Franklin Falls, N. H.

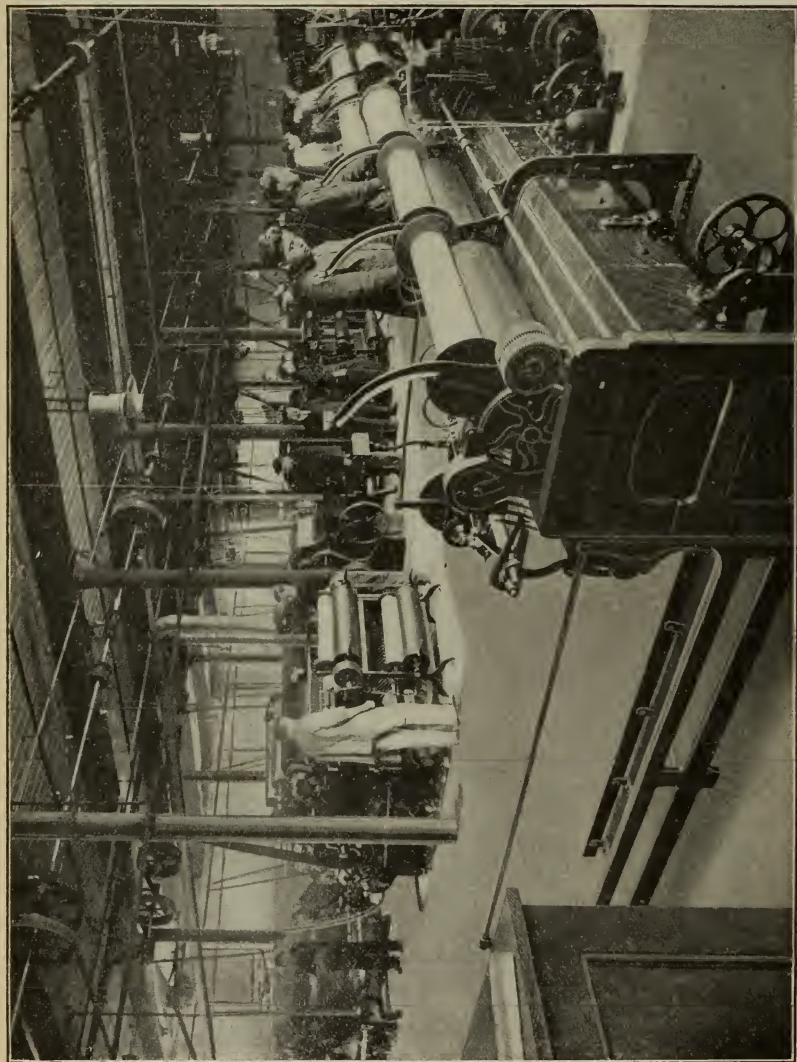
One Mayo "Acme" Full Automatic Knitting Machine with lace front attachment from Mayo Knitting Machine and Needle Company, Franklin, N. H.

One George D. Mayo Full Automatic Seamless Knitting Machine from George D. Mayo Machine Co., Laconia, N. H.

One George D. Mayo Full Automatic Knitting Machine with yarn changer and striper from George D. Mayo Machine Co., Laconia, N. H.

One Brinton Full Automatic Seamless Knitting Machine from H. Brinton Company, Philadelphia, Pa.

One Brinton 200 Needle Ribber with clearing course attachment from H. Brinton Company, Philadelphia, Pa.



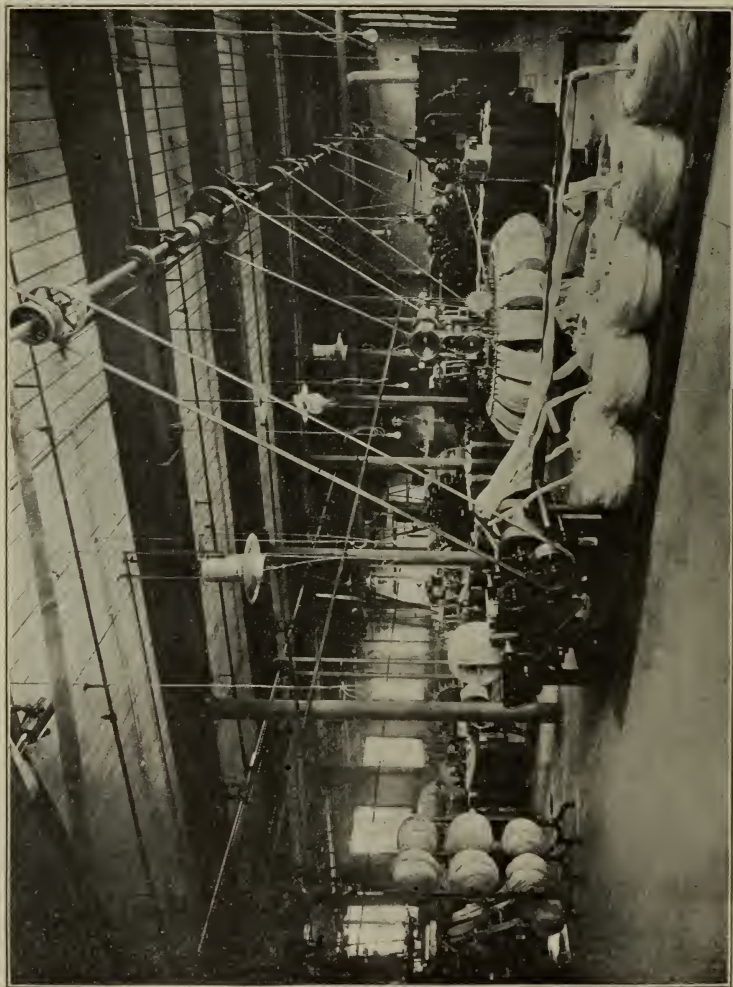
WOOLEN YARN DEPARTMENT

- One Brinton Rib Knitting Machine with Knee and Ankle Splicer and Plater from H. Brinton Co., Philadelphia, Pa.
- One McMichael and Wildman Rib Top Knitting Machine from Wildman Mfg. Company, Norristown, Pa.
- One Wildman Rib Knitting Machine, with Knee and Ankle Splicer and Automatic Stop Motion, Wildman Mfg. Co., Norristown, Pa.
- One Wildman Rib Top Machine with Automatic Stop Motion from Wildman Mfg. Company, Norristown, Pa.
- One Wildman Rib Knitting Machine with stripping automatic tucking attachment and Stop Motion from Wildman Mfg. Co., Norristown, Pa.
- One Branson Stocking Machine from Branson Knitting Machine Co., Philadelphia, Pa.
- One Banner Knitting Machine with splicing and plating attachments from the Hemphill Mfg. Co., Pawtucket, R. I.
- One Scott & Williams New Automatic Half-hose from Scott & Williams, Philadelphia, Pa.
- One Scott & Williams Ribbed Underwear Machine.
- One Crane 19 in. cylinder Flat Web Machine from Crane Mfg. Co., Lakeport, N. H.
- One Grosser, One Section Jacquard Machine from Grosser Knitting Machine Company, N. Y.
- One Grosser two thread Looper for fine work from Grosser Knitting Machine Company, New York.
- One Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Lamb Glove Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One 24 inch Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Beattie Looper from Beattie Machine Works, Cohoes, N. Y.
- One Hepworth Looper with trimming attachment from J. W. Hepworth and Co., Philadelphia, Pa.
- Five Sewing Machines, including two Shell Stitch Machines and three 2- and 3-thread Overseaming and Crocheting Machines, from Merrow Machine Co., Hartford, Conn.
- Five Sewing Machines, including machines for Overseaming, Double Stitch Covering, Seaming and Welting, Vest Finishing, etc., from Union Special Sewing Machine Co., Boston, Mass.

WOOLEN AND WORSTED DEPARTMENT

Wool Sorting and Grading

This department is thoroughly equipped with benches, baskets, etc., for sorting wool in a convenient manner, and in addition there are samples of all grades and types of wool and other fibres.



WOOL COMBING

Scouring and Carbonizing

- Wool Scouring Machinery, C. G. Sargent's Sons Corp., Graniteville, Mass., consisting of
 - Cone Duster for Grease Wool.
 - Two Scouring Bowls, each 17 ft. x 24 in., with Parallel Rakes.
 - One Automatic Feeder for Scouring Bowls.
 - One Automatic Feeder for Dryer.
 - One Single Apron Dryer.
 - Carbonizing Screw Acid Tank.
 - Carbonizing Duster, with Crush Rolls.
- From North Chelmsford Machine Co.
 - One Rinse Box.
- From Schaum & Uhlinger, Philadelphia, Pa.
 - One Hydro-Extractor.
- From C. S. Dodge, Lowell, Mass.
 - One Shoddy Picker.
 - One Bagging Stand.

Woolen

Picking

- One Parkurst Burr Picker, Atlas Mfg. Co., Newark, N. J.
- One Mixing Picker, Davis & Furber Machine Co., North Andover, Mass., equipped with Improved Mixing Picker Feed, and Spencer Oiler, both made by George S. Harwood & Son, Boston, Mass.

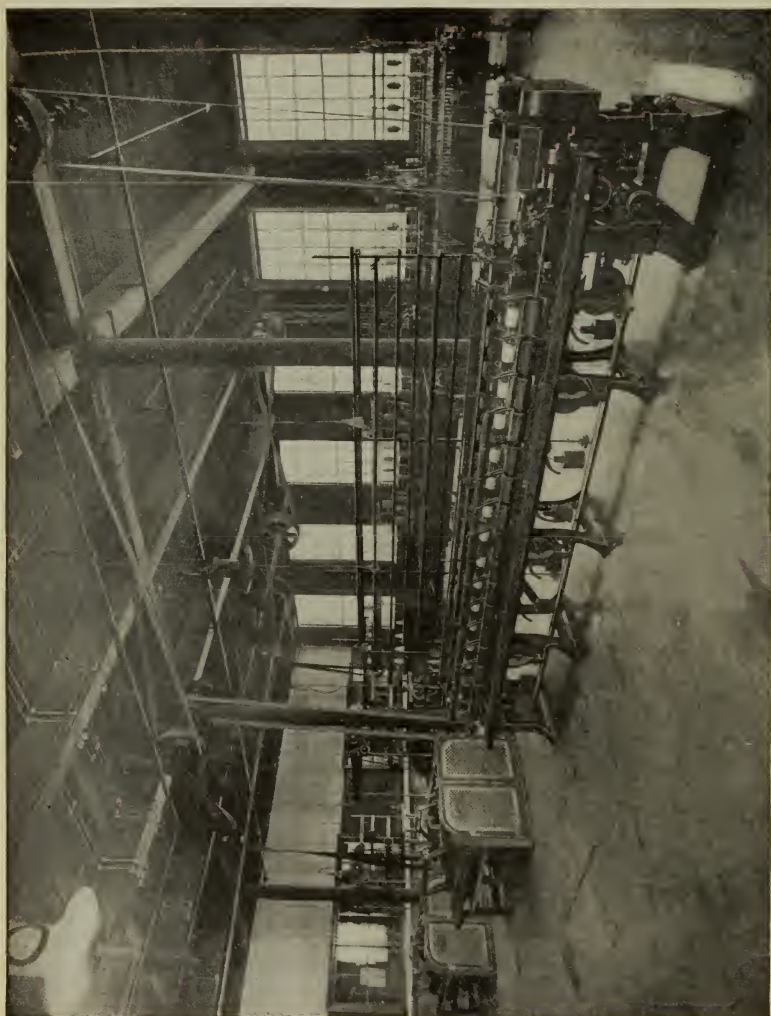
Carding

One set of Woolen Cards, including:

First Breaker, Second Breaker and Finisher, Davis & Furber Machine Co., North Andover, Mass.; this set of cards equipped with Bramwell First Breaker Feed, George S. Harwood & Son, Boston, Mass.; Torrance Balling Head and Creel, (Torrance Mfg. Co., Harrison, N. J.) between First Breaker and Second Breaker; Apperly Feed, (George S. Harwood & Son, Boston, Mass.) between Second Breaker and Finisher, and Combination Rub Rolls and Apron Condenser, (Davis & Furber Machine Co., North Andover, Mass.), on Finisher. These cards are for medium or coarse work.

One set of Davis & Furber Woolen Cards, including:

First Breaker, Second Breaker and Finisher. This set of cards equipped with Bramwell First Breaker Feed, (George S. Harwood & Son, Boston, Mass.); Apperly Feed with Kemp Traveller, (George S. Harwood & Son, Boston, Mass.), between First Breaker and Second Breaker; Bates Feed (E. V. Bates, Lowell, Mass.), between second Breaker and Finisher, and Davis & Furber Double Apron Condenser, on Finisher. These cards are for fine work.



FRENCH SPINNING

Both sets of cards are equipped with Chapman Electric Neutralizer,
made by Chapman Electric Neutralizer Co., Portland, Me.
One Sample Mixing Card, Torrance Mfg. Co., Harrison, N. J.

Spinning

- One Spinning Mule, 120 spindles, Davis & Furber Machine Co., North Andover, Mass.; Bobbin Holders, supplied by American Bobbin Holder Co., W. Medway, Mass.
- One Spinning Mule, 120 spindles, Johnson & Bassett, Worcester, Mass.; Bobbin Holders supplied by Murdock & Geb, Franklin, Mass.
- One 1907 Fancy Yarn Twister, 20 spindles, Davis & Furber Machine Co., North Andover, Mass.

Card Grinding

- One Roy Grinding Frame, B. S. Roy & Son, Worcester, Mass.
- Two Roy Traverse Grinders, B. S. Roy & Son, Worcester, Mass.
- One Entwistle Traverse Grinder, T. C. Entwistle Co., Lowell, Mass.
- One Complete set of Carder's Tools, W. H. Brown, Worcester, Mass.

Worsted

Carding

- One 50-inch Double-cylinder Worsted Card (4 lickerin), Davis & Furber Machine Co., North Andover, Mass., equipped with Bramwell Feed, George S. Harwood & Son, Boston; also equipped with a Chapman Electric Neutralizer, Chapman Electric Neutralizer Co., Portland, Me.

Backwashing

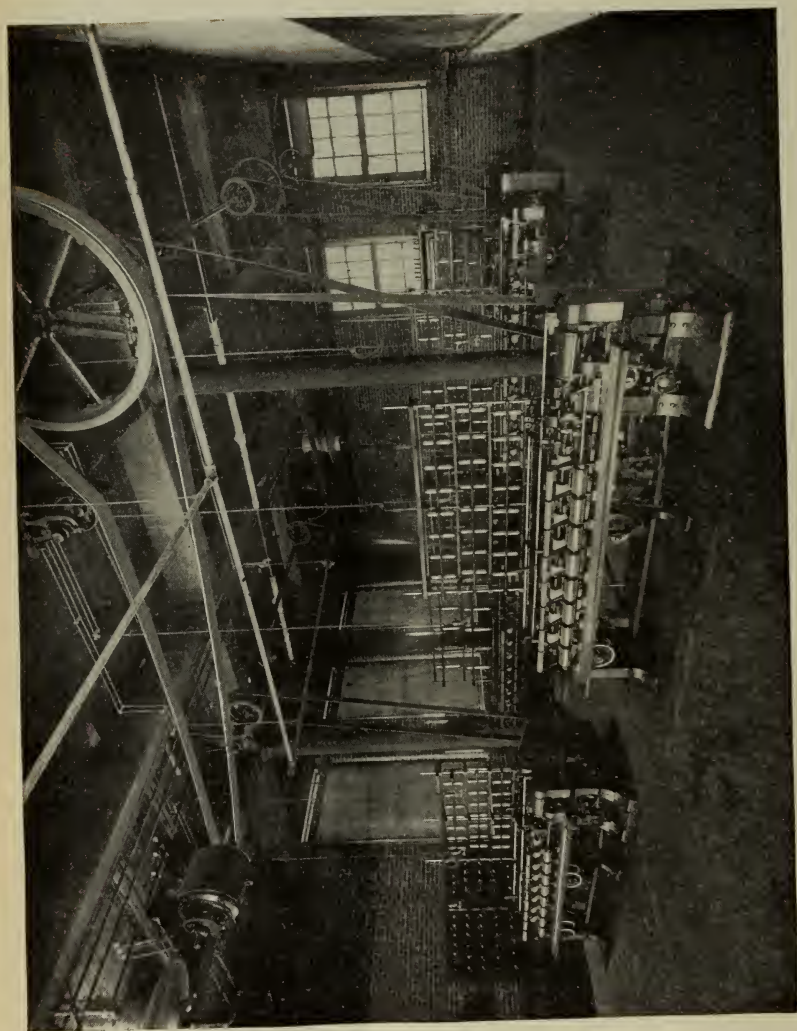
- One Double Bowl, Five Cylinder Backwasher, with Gill Box, Taylor-Wadworth & Co., Leeds, Eng., equipped with blueing motion, oiling motion, and Layland Patent pressure motion.

Gilling

- One Doubling Balling Head Gill Box (with double screws), Lowell Machine Shop, Lowell, Mass.
- One Weigh Gill Box and Creel, Lowell Machine Shop, Lowell, Mass.

Combing

- One Baller, (punch), Crompton & Knowles, Worcester, Mass.
- One Noble Worsted Comb, Crompton & Knowles, Worcester, Mass.



FRENCH SPINNING

Gilling

One Finishing Can Gill Box, Hall & Stell, Keighley, England.
One Finishing Balling Head Gill Box, Hall & Stell, Keighley, England.

Bradford System of Drawing, Spinning and Twisting

The following Drawing, Spinning and Twisting Machinery, from
Prince Smith & Son, Keighley, England.

One Revolving Creel for 12 Balls.	One Double Head Can Gill Box.
One 2 Spindle Drawing Box.	One 2 Spindle Gill Box.
One 2 Spindle Weigh Box.	One 12 Spindle Flyer Spinner.
One 4 Spindle First Finisher.	One 12 Spindle Ring Spinner.
One 12 Spindle Dandy Reducer.	One 12 Spindle 2 Fold Cap Twister.
One 12 Spindle Cap Spinner.	One 12 Spindle 6 Fold Ring Twister.

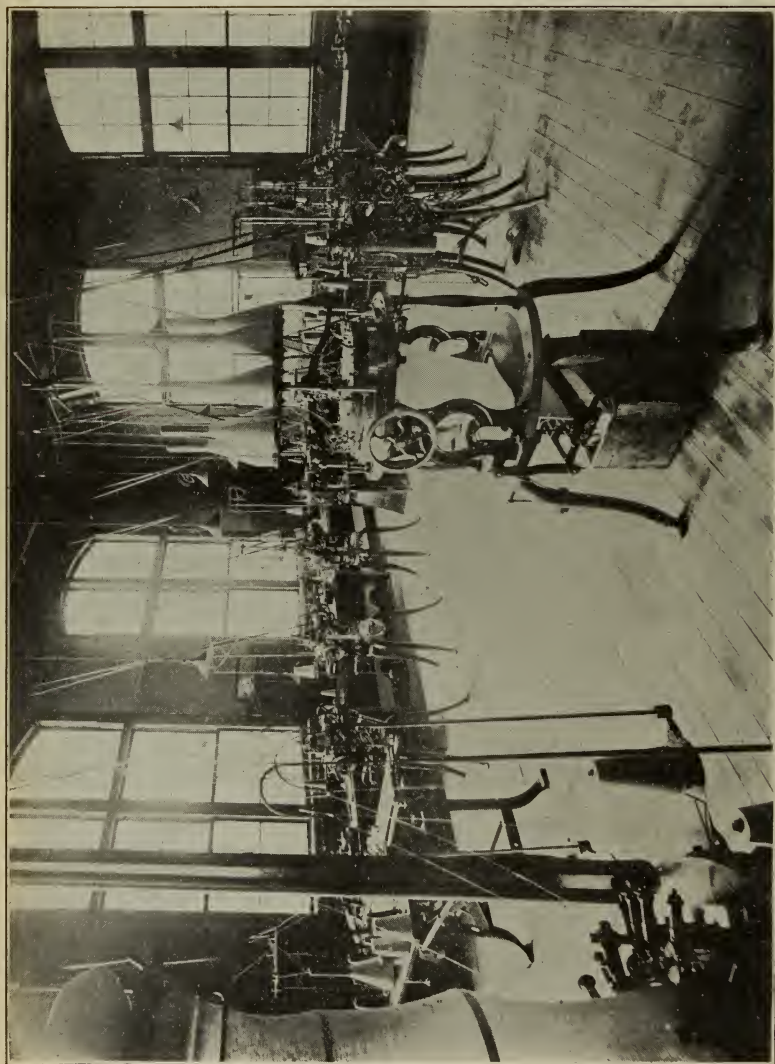
The following Drawing, Spinning and Twisting Machinery from the
Lowell Machine Shop, Lowell, Mass.:

One 2 Spindle Drawing Box.	One 8 Spindle Cone Rover.
One 6 Spindle Second Finisher.	One 48 Spindle Cap Spinner, 4 ft. end.
One 24 Spindle Dandy Rover.	One 48 Spindle Cap Spinner, 5 ft. end.
One 6 Spindle Cone Reducer.	One 48 Spindle Boyd Ring Twister.
One Six Gang Universal Winder, equipped for cones or straight tubes, Universal Winding Co., Boston, Mass.	
One Tape Band Sewing Machine, The Singer Mfg. Co., New York.	

French System of Drawing and Spinning

The machinery made by the "Societe Alsacienne de Constructions
Mechaniques" at Mulhouse, France, consists of the following:

Peigneuse-Laine modèle P. L. B.	Model P. L. B. Comb with creel for 24 doublings.
Intersecting de 2 têtes. Pass. I and II après Peigneuses.	Intersecting Gill Box (2 heads)
Gill Box (2 têtes)	Gill Box (2 heads)
Étirage à Frottoirs (2 têtes)	1st Drawing (2 heads)
tirage à Frottoirs (2 têtes)	2nd Drawing (2 heads)
Étirage à Frottoirs (2 têtes)	3rd Drawing (2 heads)
Étirage Réunion (4 Peignes)	Reducer (4 Porcupines)
Bobinier de Chûte (8 Peignes)	Slubber (8 Porcupines)
Bobinier (8 Peignes)	1st Intermediate (8 Porcupines)
Bobinier (8 Peignes)	2nd Intermediate (8 Porcupines)
Bobinier (8 Peignes)	Rover (8 Porcupines)
Finisseur (16 Peignes)	Finisher (16 Porcupines)
Self-acting à Filer (150 Broches)	Self-acting Worsted Mule (150 Spindles)



KNITTING DEPARTMENT

The apparatus in this department for obtaining and preserving the requisite condition of humidity consists of:

Four Humidifiers of the American Moistening Co., Boston, Mass.

Nine Turbo Humidifier Heads from The G. M. Parks Co., Fitchburg, Mass. The compressed air for these heads is supplied by an Ingersoll-Rand 8 x 8 steam driven air compressor located in power house.

Yarn Weighing and Testing

From Lowell Scale Company:

One Large Platform Scale.

From Howe Scale Company

One Dram Scale.

One Gram Scale.

One Ounce Scale.

One Pound and Ounce Scale.

Two Yarn Reels.

One Roving Reel.

Three Grain Scales.

One Run Beam.

One Hand Yarn Strength Tester.

Two Twist Counters.

Two Barbour Knotters.

DESIGN AND POWER WEAVING DEPARTMENT

Cotton Warp Preparation

One Spooler, Lowell Machine Shop, Lowell, Mass.

One Warper, Lowell Machine Shop, Lowell, Mass.

One Slasher, Lowell Machine Shop, Lowell, Mass.

One Beamer, T. C. Entwistle Co., Lowell, Mass.

One Winder, Altemus & Co., Philadelphia, Pa.

One 400 End Improved Draper Warper, Draper Co., Hopedale, Mass.
Drawing-in Frames, etc.

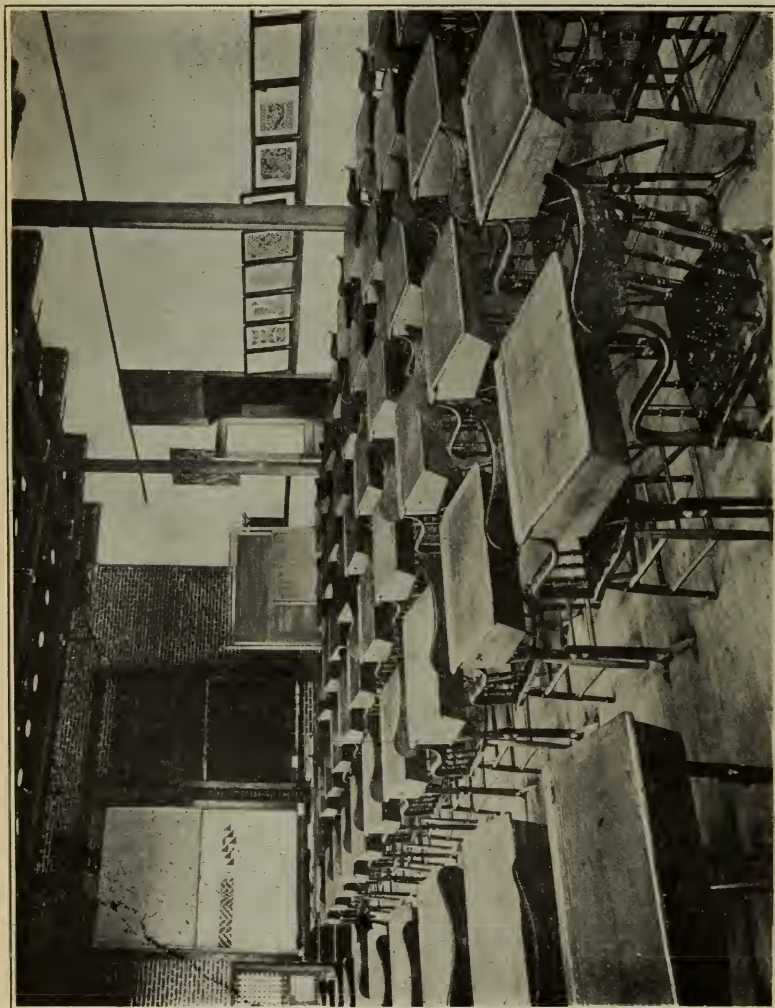
One Pat. Slasher Press Roll, J. Battles & Co., Lawrence, Mass.

One Pat. Expansion Comb for Warper, T. C. Entwistle Co., Lowell, Mass.

One Quiller, Johnson & Bassett, Worcester, Mass.

Set of six in. spools for Warper, Macrodi Fibre Co., Woonsocket, R. I.

One Universal Winder for Cop and Bobbin winding, Universal Winder Co., Boston, Mass.



DESIGN LECTURE ROOM

Woolen and Worsted Warp Preparation

- Two 40 End Jack Spoolers.
- Two Spool Racks for 12 spools each.
- One Pattern Dry Frame Dresser.
- One Pipe and Cylinder Dresser.
- One 60 inch Reel.
- One 82 inch Reel.
- One Double Head Beamer.

All made by the Davis & Furber Machine Co., North Andover, Mass.

Braiding Machinery

- One 24 Line Hercules Braider.
- One 12 Line Braider.
- One Tubular Braider.
- One Sautach Braider.

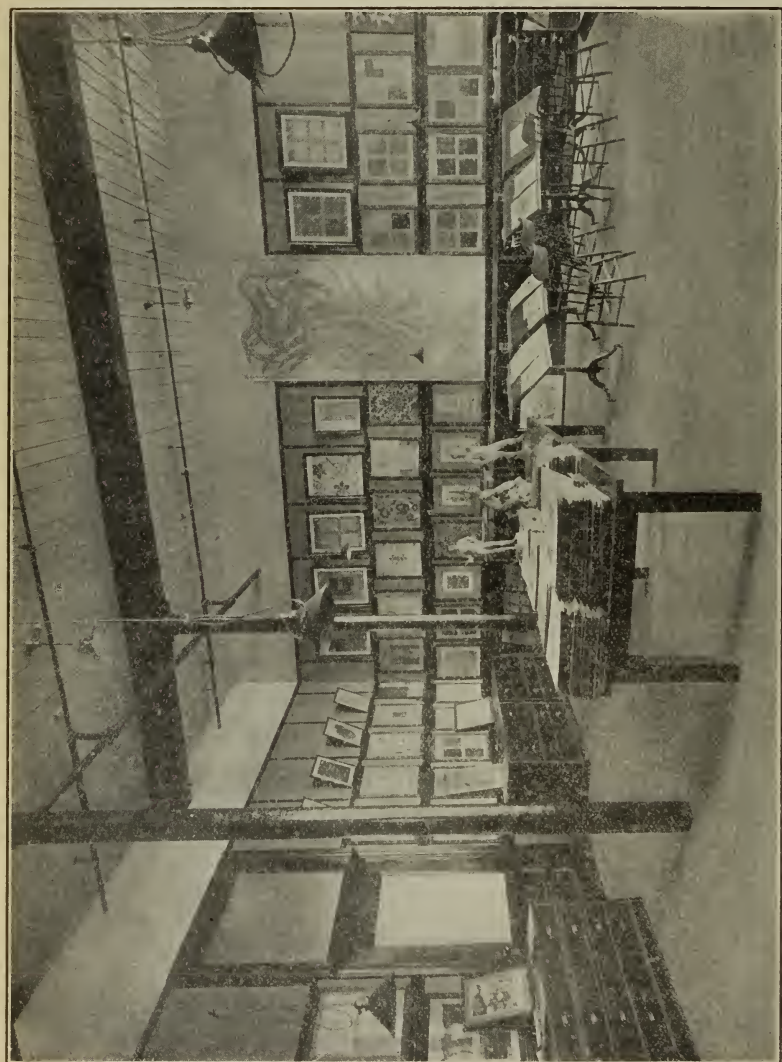
All made by the New England Butt Co., Providence, R. I.

Silk Preparing Machinery

- One Winder, Atwood Machine Co., Stonington, Conn.
- One Ribbon Quiller, Atwood Machine Co., Stonington, Conn.
- One Warper and Beamer, Swiss Style, Atwood Machine Co., Stonington, Conn.
- One Double Frame, Atwood Machine Co., Stonington, Conn.

Plain Looms

- One Plain Northrop Loom, Draper Co., Hopedale, Mass.
- One Plain Print Cloth Loom, Whitin Machine Works, Whitinsville, Mass. To this is attached a Kip-Armstrong Warp Electric Stop Motion.
- One Plain Print Cloth Loom, Mason Machine Works, Taunton, Mass.
- One Kilburn & Lincoln Plain Loom.
- Eight Lowell Machine Shop Plain Looms.
- One English Loom, Hattersley.
- One Improved Northrop Loom, fine sateen, Draper Company, Hopedale, Mass.
- One Eight Harness Corduroy Loom, Draper Company, Hopedale, Mass.
- One Side Cam Twill Loom, Whitin Machine Works, Whitinsville, Mass.
- One Five Harness Sateen Loom, Lowell Machine Shop, Lowell, Mass.
- One Harriman Automatic Shuttle Changing Loom.
- One Lewiston Machine Co. Loom, 4 harness, side cam.
- One Crompton Jean Loom.



DECORATIVE ART

Fancy Looms

- One Northrop Loom with dobbie, Draper Co., Hopedale, Mass.
- One Lewiston Machine Company Bag Loom.
- One Knowles Gingham Loom, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Gingham Loom, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Towel Loom, 2 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Lappet Loom, with 16 harness dobbie, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 20 harness dobbie, 4 x 1 boxes, for fancy leno work, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 25 harness dobbie, Crompton-Knowles Loom Works.
- One Crompton Fancy Cotton Loom, single cylinder, 20 harness dobbie, Crompton-Knowles Loom Works.
- One Knowles Gem Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Worsted Loom, 24 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Fancy Loom, 6 x 1 double cylinder, 20 harness dobbie, Crompton-Knowles Loom Works.
- One Twenty Harness Dobby Loom, Whitin Machine Works, Whitinsville, Mass.
- One Crompton & Knowles Heavy Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Knowles Blanket Loom, 25 harness dobbie, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Knowles Worsted Loom, 32 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- Three Knowles Heavy Woolen Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- Three Crompton & Knowles Intermediate Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Model Dobby Attachment.

Jacquard Looms

- One Knowles Fancy Loom, single lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, double lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, Jacquard tied up for leno, Crompton-Knowles Loom Works.
- One Knowles Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.



HAND LOOMS

- One Crompton Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Stafford Silk Loom, 1200 hook Halton Jacquard.
- One Crompton & Knowles 72 in. Tapestry Loom with 2600 hook Halton Jacquard Head.
- One 400 hook single lift, Schaum & Uhlinger Jacquard mounted for 4 bank narrow fabric loom.
- One 840 hook double lift, single cylinder Jacquard on Crompton-Knowles 4 bank ribbon loom.
- One 800 hook double lift Knowles Gem Silk Brocade Jacquard Machine, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Felix Tonnar German Plush Loom with 400 hook Crompton-Knowles Jacquard Head.

Card Cutting Machines

- One Jacquard Fine Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.
- One Jacquard French Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.

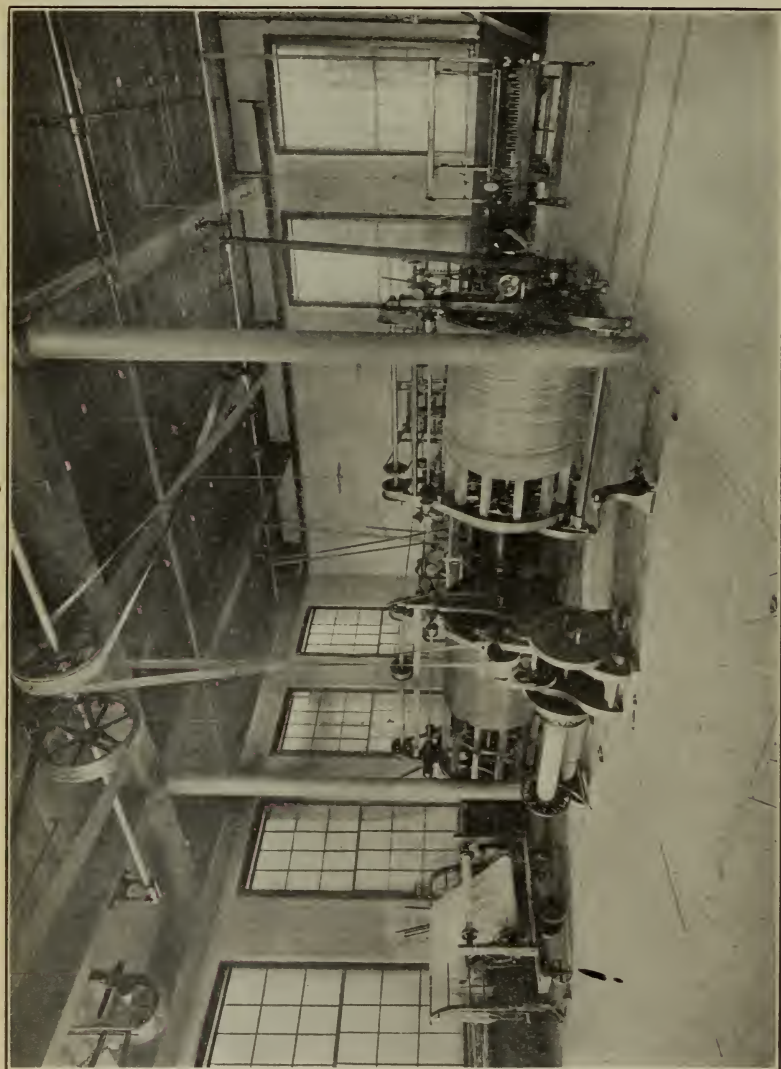
Hand Loom Weaving

- Twelve Hand Looms, 3 x 3 boxes, 20 harness dobby.
- Eight Hand Looms, 4 x 4 boxes, 24 harness dobby.
- Eight Hand Looms, 3 x 3 boxes, 32 harness dobby.
- Six Hand Looms, 4 x 4 boxes, 30 harness dobby.
- Two Hand Looms, 4 x 4 boxes, 32 harness dobby.
- Two Hand Looms, 4 x 4 boxes, 200 hook Jacquard.
- Two Hand Looms, 3 x 3 boxes, 200 hook Jacquard.
- Two Hand Looms, 3 x 3 boxes, 600 hook Jacquard.
- One Hand Loom, 48 harness.
- Two Hand Looms with treadles.
- Pattern Warping Stands.
- Beaming, drawing-in stands, etc.

CHEMISTRY AND DYEING DEPARTMENT

Chemical Laboratories

- The General Chemistry and Qualitative Analysis Laboratory includes:
 - One hundred and twenty laboratory desks, each containing a full set of apparatus for the first year's work in Chemistry; also gas and water fittings, reagents and sinks.
 - Four Large Double Hoods.
 - Two Steam Baths.
 - Two Parson's Automatic Gas Generators.



WOOLEN AND WORSTED WARP PREPARATION

Quantitative Laboratory

- One Water Distilling Apparatus.
- One Steam Drying Closet and Several Drying Ovens.
- One Large Steam Bath.
- One Electrolytic Table.
- Five Hoods.
- Fifty laboratory desks, each fully provided with apparatus.

Balance Room

- One Large Christian Becker Analytical Balance.
- Seven Small Christian Becker Analytical Balances.
- One Standinger Analytical Balance.
- One Eimer & Amend Analytical Balance.
- One H. L. Becker's Son & Co. Analytical Balance.

Combustion Room

- One Combustion Furnace, 25 burners.
- One Lothar Meyer's Furnace for tubes.
- One Kerosene Burner Muffle Furnace.

Microscopic and Colorimetric Laboratory

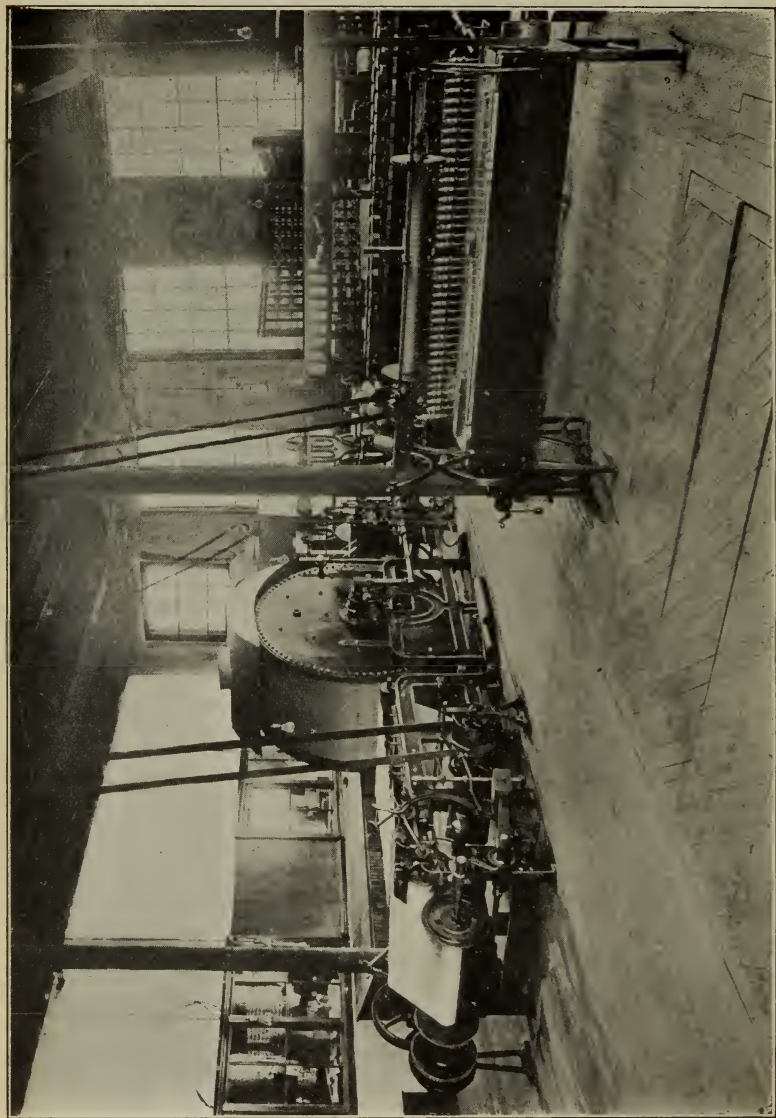
- Two Benches for microscopical work.
- Three Bausch & Lomb Compound Microscopes.
- One Nachet et Fils Compound Microscope.
- One Tintometer.
- One Ives Colorimeter.
- Desks and shelves for the apparatus and reagents necessary for this branch of the work.
- Adjoining this Laboratory is a dark room for Spectrum Analysis, Photometric Work, etc.

Assistant Instructor's Laboratory

- One Large Case of Chemicals.
- One Double Hood.
- One Copper Water Bath.
- One Soapstone Sink with a drain board.
- Benches, desks and complete fittings for water, gas and suction.

Private Laboratory

- One Groemner Balance.
- One Large B. & L. Microscope.
- One Parr Calorimeter.
- One Case for Chemicals and Apparatus.
- Three Laboratory Benches, with necessary fittings.
- One Large Hood.



COTTON WARP PREPARATION

One Steam Bath.
One Experimental Dye Apparatus.
One Porcelain Sink and Drain Board.

Chemical Lecture Room

Is provided with a lecture table fully equipped with gas, water, sinks, a hood and sufficient apparatus for lecture experiments.
An electric arc reflectroscope provided with suitable screen, which makes it possible to illustrate a lecture either from slides or by cuts, photographs or objects.
Seats are provided for eighty students, and are arranged on a raised floor so that every student has a full view of the lecture table.
This room contains various collections of dyestuffs and chemicals for exhibition and for lecture demonstration.

Experimental Dyeing Laboratory

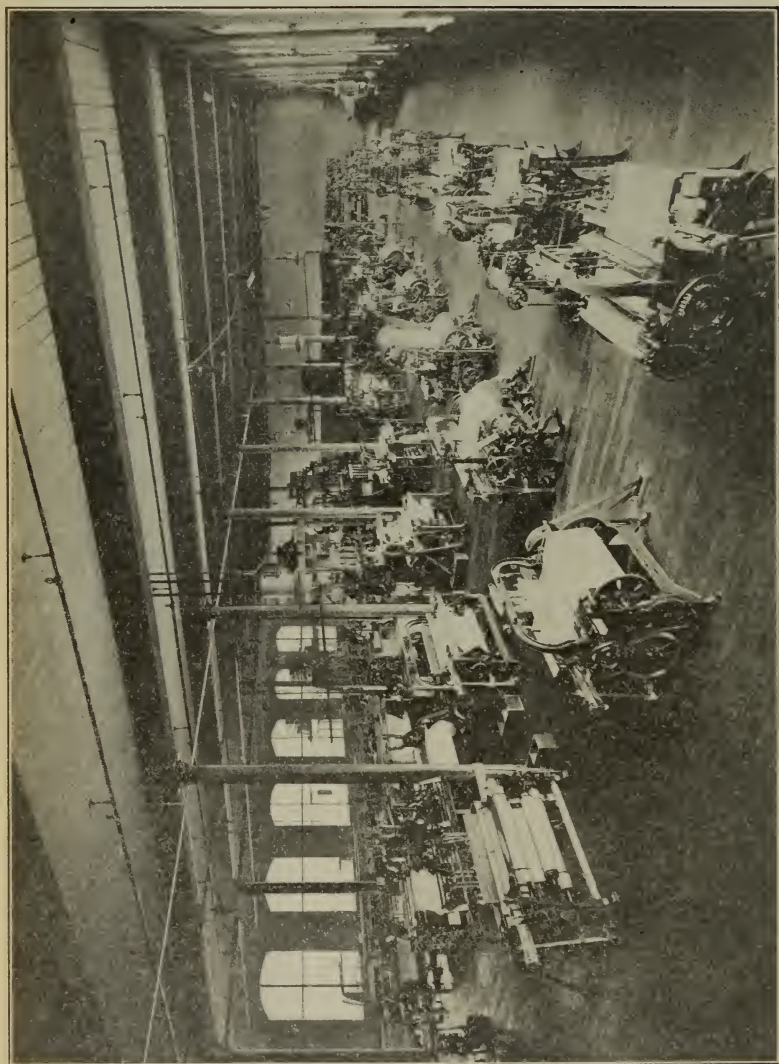
The dyeing laboratory is equipped with individual benches, small dyeing apparatus, reels, balances, apparatus for dye testing, such as frames for exposing dyed material to light, and a complete collection of dyestuff samples and sample cards.
One Small Hydro-Extractor, from W. H. Tolhurst & Son, Troy, N. Y.
Twenty-four Steam Jacketed Experimental Dyeing Machines.
Thirty Steam Coil Experimental Dyeing Machines.
One Drying Chamber.
One Ageing Chamber.

Experimental Printing Laboratory

One Calico Printing Machine, made by Mather & Platt, Oldham, England.
One Iron Jacketed Steaming Chamber from A. Edmeston & Son, Salford, England.
One set of Steam Jacketed Copper Kettles.

Fuel and Oil Analysis Laboratory

Mahler Bomb Calorimeter, with complete outfit.
Emerson Bomb Calorimeter, with complete outfit.
Parr Calorimeter.
Abbe Refractometer.
Torsion Viscosimeter.
Tagliabue Viscosimeter.
Tagliabue Cold Test Apparatus.
Pensky Martin Oil Tester.
N. Y. State Oil Tester.
Sartorius Specific Gravity Balance.
Two Becker Analytical Balances.



WEAVE ROOM

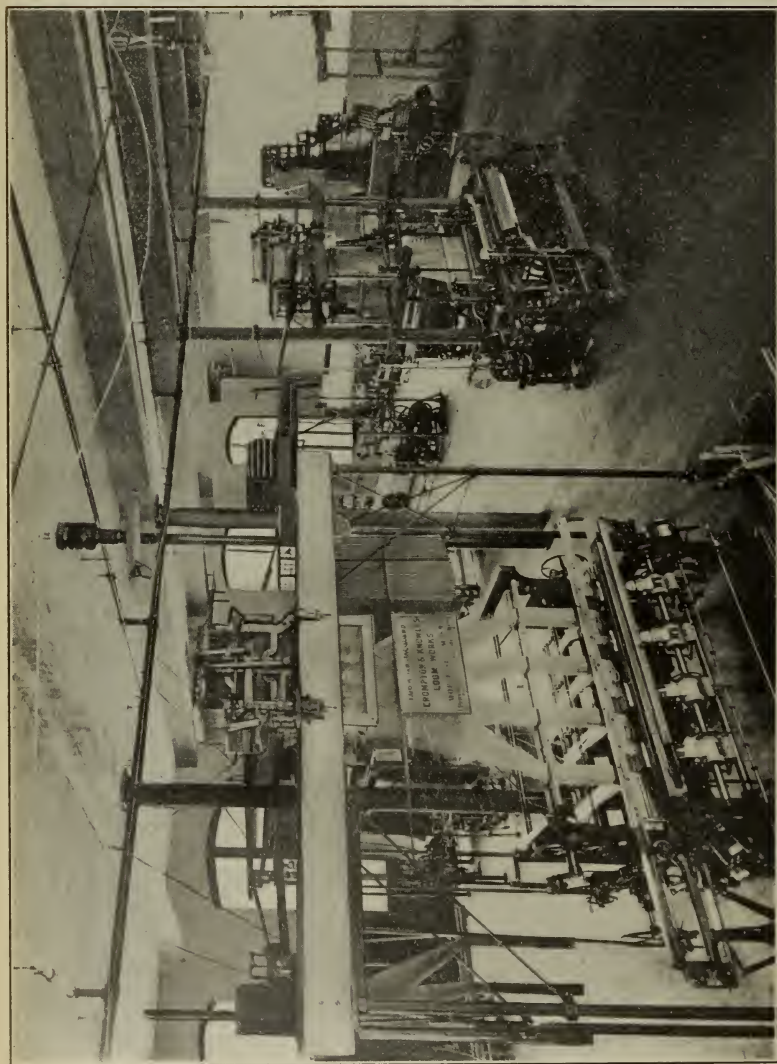
Gas Muffle Furnace.
Kny Scherer Oil Tester.
Graefe Gas Calorimeter.
Orsat Gas Analysis Apparatus.
Laboratory Tables, Lockers and Hoods.

Industrial Chemistry Laboratory

One Filter Press, Type E, T. Shriver and Co.
One Single Acting Triplex Plunger Pump, Gould's Mfg. Co.
One Vacuum Drying Apparatus, Norman Hubbard's Sons.
One Surface Condenser, Norman Hubbard's Sons.
One Packard Vacuum Pump, Norman Hubbard's Sons.
One Vacuum Evaporator, Swenson System, American Foundry and Machine Co.
One Centrifugal, C. H. Chavant and Co.
One Double Jar Mill, F. I. Stokes and Co.
One Sturtevant Ore Crusher.
One Sturtevant Pulverizer.
Ten Copper Steam Baths, D. H. Wilson and Co.
One 36 in. Ventilating Fan, Mass. Fan Co.
One Autoclave.
Twenty-four Lockers.
Two Concrete Top Tables.

Commercial Dyeing Laboratory

One Kier, Atlantic Works, East Boston, Mass.
One small Kier, fitted with E. D. Jefferson's circulating device.
One Electrolyzer for manufacturing bleaching solutions, The National Laundry Machinery Co., Dayton, Ohio.
One 4 String Dyeing Machine, Rodney Hunt Machine Co., Orange, Mass.
One Mercerizing Machine.
One Raw Stock Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
One Yarn Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
One Jig Dyeing Machine, The Textile-Finishing Machinery Co., Providence, R. I.
One set of Drying Cans, The Textile-Finishing Machinery Co., Providence, R. I.
One Chain Dyeing Machine, T. C. Entwistle Co., Lowell, Mass.
One Raw Stock Drying Table, Philadelphia Textile Machinery Co., Philadelphia, Pa.
One Padding Machine, Arlington Machine Works, Arlington, Mass.
One Hydro-Extractor, W. H. Tolhurst & Son, Troy, N. Y.

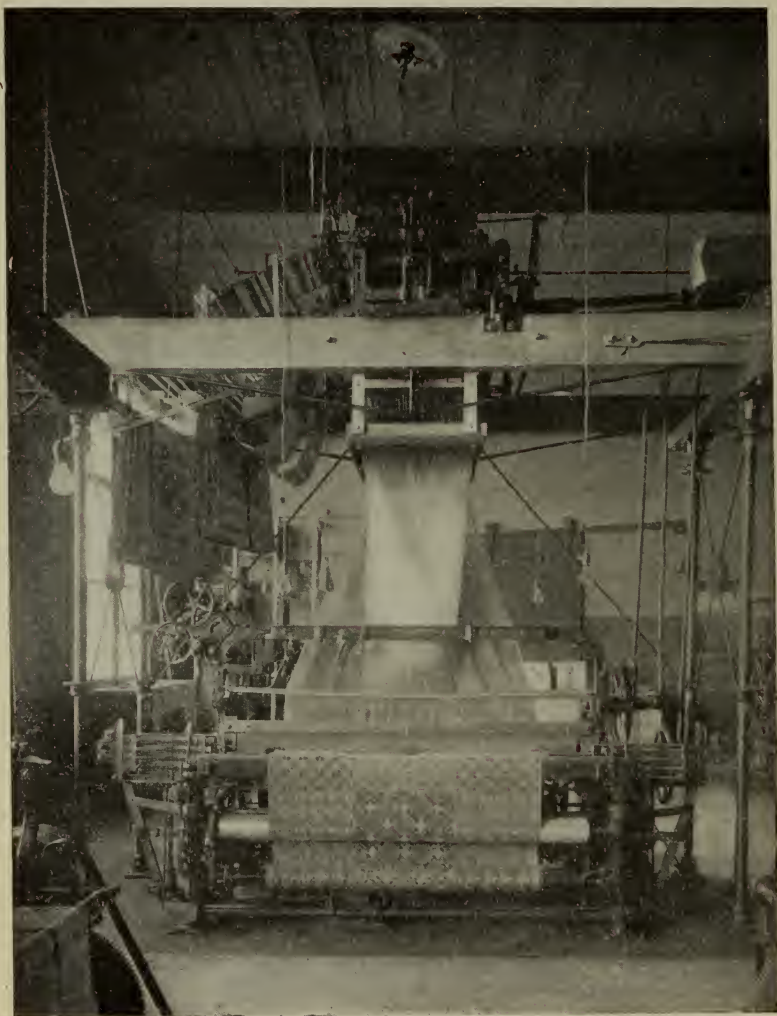


WEAVE ROOM, JACQUARD SECTION

One Experimental Dyeing Machine, The Psarski Dyeing Machine Company, Cleveland, Ohio.
Seven Dye Tubs.
One Power Yarn Reel.
One Reeves' Variable Speed Device.
Two Trucks.

FINISHING DEPARTMENT

One 2 string Washer, Rodney Hunt Co., Orange, Mass.
One Fulling Mill, Rodney Hunt Co., Orange, Mass.
One Sample Fulling Mill, James Hunter & Co., North Adams, Mass.
One Up and Down Dry Gig, Curtis & Marble, Worcester, Mass.
One Rolling and Stretching Machine, Curtis & Marble, Worcester, Mass.
One Up and Down Wet Gig, Curtis & Marble, Worcester, Mass.
One Steam Finishing Machine, Curtis & Marble, Worcester, Mass.
One 60 in. 3 burner Singeing Machine, adapted for Cotton, Silk or Worsted Goods, Curtis & Marble, Worcester, Mass.
One Two Cylinder Double Acting Brushing Machine, Curtis & Marble, Worcester, Mass.
One 60 in. 4 Cylinder Sanding and Polishing Machine, Curtis & Marble, Worcester, Mass.
One Kicker Mill, James Hunter & Co., North Adams, Mass.
One 6-4 Double Shear, Parks & Woolson, Springfield, Vt.
One Single Shear, Curtis & Marble. Donated by Mass. Mohair Plush Co., Lowell, Mass.
One Dewing Machine, G. W. Voelker & Co., Woonsocket, R. I.
One 6-4 Voelker Rotary Press, G. W. Voelker & Co., Woonsocket, R. I.
One Tentering and Drying Machine, John Heathcote, Providence, R.I.
One Single Crabbing Machine, H. W. Butterworth & Son, Philadelphia, Pa.
One 72 in. Woolen Napper, Davis & Furber, North Andover, Mass.
One 32 in. Basket Hydro-Extractor, W. H. Tolhurst, Troy, N. Y.
One A. W. C. Measuring and Weighing Machine, Parks & Woolson, Springfield, Vt.
One Lintz & Eckhardt Cloth Numbering Machine, improved by Durbrow & Hearne Mfg. Co., New York.
One Steam Press for Underwear, United States Hoffman Co., Syracuse, N. Y.
One Sewing Machine, Birch Brothers, Somerville, Mass.
Soap tanks, perch, burling and measuring tables.



A TAPESTRY LOOM

ENGINEERING DEPARTMENT

PHYSICAL LABORATORY

Through the generosity of a friend of the School a laboratory has been provided with the most approved apparatus for testing the physical properties of all fibres, yarns and fabrics; the equipment includes:

One Bausch and Lomb D. D. Microscope.

Two inch, 1 inch, and 1-2 inch regular eyepieces.

Three-fourths inch (photographic), 2-3 inch, 1-6 inch, 1-12 inch (oil immersion) objectives.

One Eye Piece Micrometer.

One Filar Micrometer, (1 inch equivalent eyepiece) for refined diameter determinations.

One Standard Glass Stage, divided to 1-10 and 1-100 m. m. with corrections as tested against the International m. m.

Complete outfit for mounting shades.

Complete outfit for photo micrography.

Camera Lucida.

Microtome Sectioning Outfit.

One Small Skein Testing Machine.

One Conditioning Oven for moisture determination.

One Yarn Testing Machine, adjusted to test strength, twist, take up, elasticity, and stretch.

One Hydraulic Cloth Strength Testing Machine for 4 inch samples.

One Cloth Strength Testing Machine for 1 inch samples.

One Brown & Sharpe Metre Reel.

Miscellaneous apparatus for experiments in Mechanics, Heat, Light, Sound and Electricity.

The proper conditions of humidity in this laboratory are obtained and maintained by one Air Turbo Humidifier Head, made and installed by The G. M. Parks Mfg. Co., Fitchburg, Mass., and also by one Humidifier Head made by Schutte & Koerting Co., Philadelphia, Pa.

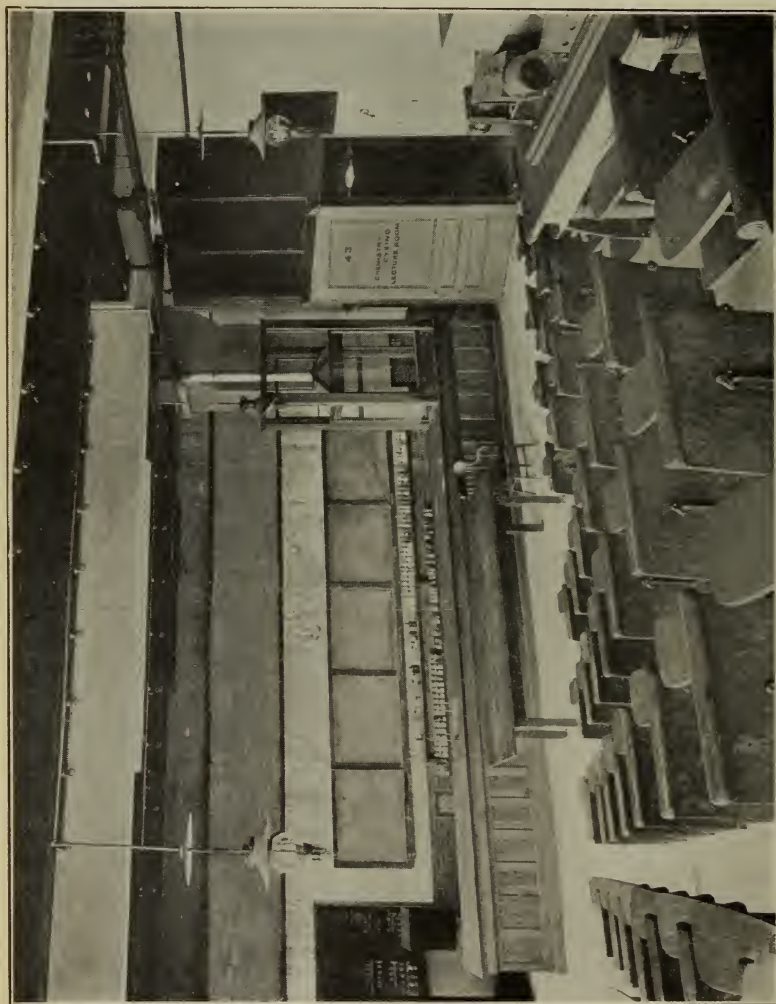
ENGINEERING LABORATORY

The engineering laboratory contains the following equipment:

50 H. P. Allis-Chalmers Corliss Steam Engine (Reliance type) for experimental purposes arranged to operate condensing or non-condensing and direct connected to an Alden absorption dynamometer.

Wheeler Surface Condenser (200 sq. ft. surface) with 5 in. x 6 in. x 6 in. x 7 in. combined air and circulating pump.

25 K. W. Kerr Steam Turbine (7 stage) direct connected to 25 K. W. Richmond Electric Co. alternating current generator and arranged for both condensing and non-condensing conditions. The piping is also arranged that this turbine may be run as a low pressure



CHEMISTRY LECTURE ROOM

turbine in conjunction with the Allis Chalmers engine. The generator is especially designed for experimental work with connections and windings for all the commercial phases.

5000 gallon Pressure Tank for heads up to 300 ft. and connections for experimental work.

Two 2500 gallon Concrete Storage Tanks.

Complete set of Weighing and Suction Tanks on Fairbanks Standard scales.

Deane Triplex Power Pump, 4 in. x 6 in.

Clayton Air Compressor (belted type) 6 in. x 6 in.

Centrifugal Pump, 2 inch (belted type), Lawrence Machine Company, Lawrence, Mass.

Two Sturtevant Fan Blowers for experimental work.

Metropolitan Injector.

Differential Transmission Dynamometer.

Variable Speed Transmission.

Accessory apparatus such as steam and gas engine indicators, planimeters, thermometers, etc. Apparatus for gas analysis is also available and the chemical department is fully equipped for calorific determinations of fuels.

All steam supplied to the laboratory passes through a 4 inch horizontal Cochrane steam separator to insure dry steam for experimental work.

Buff & Buff Engineers Transit.

Philadelphia Level Rod.

Apparatus for testing friction and slip of belts and pulleys.

Standard Westinghouse A. C. Generator, Switchboard Panel with special instruments and connections for 25 K. W. turbo-generator in 2-phase, 3-phase or single phase.

Westinghouse Portable Polyphase A. C. Wattmeter with series transformers.

Two General Electric A. C. Ammeters.

One General Electric A. C. Voltmeter.

General Electric 3 H. P. Induction Motor.

Allis-Chalmers 10 H. P. Direct Current Motor.

One 4 H. P. G. E. Electric Dynamometer which may be used as a double current generator or rotary transformer receiving direct current at 220 volts and delivering three phase alternating current which by a step-up transformer will give 220 volts at 60 cycles.

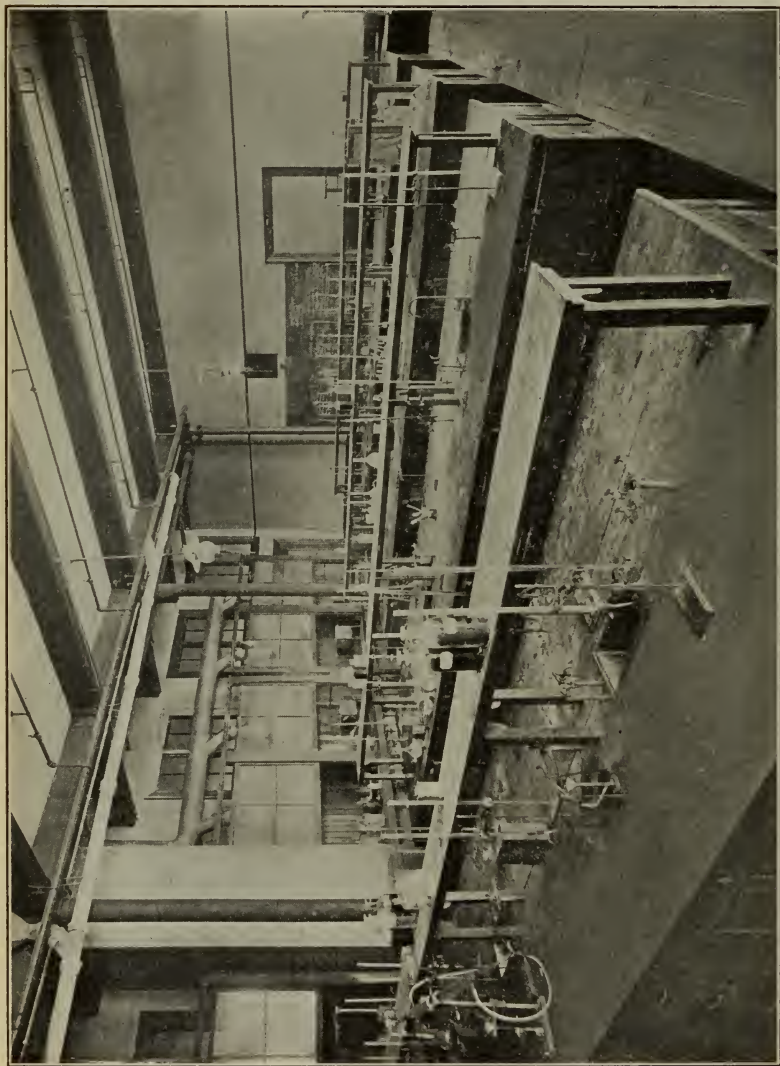
One 250 volt Weston Portable Voltmeter.

One 250 volt Weston Portable Voltmeter with calibrating coil.

One 150 ampere Weston Portable Ammeter.

One Weston Portable Millivoltmeter with 200 milli-volt and 20 milli-volt scales.

One 2 ampere and one 20 ampere Shunt for use with above instrument as an ammeter.



QUANTITATIVE LABORATORY

- One D'Arsonval Reflecting Galvanometer.
- One Simple Galvanometer.
- One Wheatstone Bridge.
- Two Direct Current Self-feeding Arc Lamps.
- Two Hand Feed Arc Lamps for stereopticons.
- Resistance boxes of various sizes and other apparatus necessary for commercial testing of lamps, motors, etc.
- An Exhibition Board containing samples of the Chloride and Exide Storage Battery Plates donated by the Electric Storage Battery Co. of Philadelphia.

Machine Shop

The equipment of the machine shop is as follows:

- Four Standard Engine Lathes, 13 inch swing, 6 ft. bed, from Flather & Co., Nashua, N. H.
- Three Standard Engine Lathes, 14 inch swing, 6 ft. bed, from Flather & Co., Nashua, N. H.
- One Standard Engine Lathe, 15 inch swing, 6 ft. bed, from F. E. Reed Co., Worcester, Mass.
- One Engine Lathe, 18 inch swing, 10 ft. bed, from Flather & Co., Nashua, N. H.
- One Engine Lathe, 18 inch swing, 6 ft. bed, from Champion Tool Works, Cincinnati, Ohio.
- One Standard Engine Lathe, 15 inch swing, 6 ft. bed, from S. H. Putnam Sons, Fitchburg, Mass.
- Five Speed Lathes, 17 inch swing, 5 ft. bed, from J. G. Blount, Everett, Mass.
- One No. 1 Universal Milling Machine, with all three feeds automatic, from Kempsmith Mfg. Co., Milwaukee, Wis.
- One 24 in. x 24 in. 6 ft. Planer, from the Mark Flather Planer Co., Nashua, N. H.
- One 23 inch Upright Drill with back gears and power feed, from J. E. Snyder & Son, Worcester, Mass.
- One 14 inch Single Sensitive Drill from the Stanley Mfg. Co., Lawrence, Mass.
- One No. 1 Universal Grinder from Landis Tool Co., Waynesboro, Penn.
- One 20 inch Wet Tool Grinder from J. G. Blount, Everett, Mass.
- One 12 inch, Two Wheel, Dry Grinder from J. G. Blount, Everett, Mass.
- One American Twist Drill Grinder from the Heald Machine Co., Worcester, Mass.
- One Type 1 B Portable Electric Grinder from the Cincinnati Elec. Tool Co., Cincinnati, Ohio.
- One 30 inch Grindstone and Frame from the Athol Machine Co., Athol, Mass.



BALANCE ROOM

One Single Spindle Centering Machine from D. E. Whiton Machine Co., New London, Conn.

One 15 inch Shaper from Potter & Johnson, Pawtucket, R. I.

One Power Hack Saw from the Fairbanks Co., Boston, Mass.

One Cold Saw from John T. Burr & Son, Brooklyn, N. Y.

Two Blacksmith Forges, Anvils and Tools are also provided and a Gas Oven for hardening and tempering tools.

These tools are fully equipped with chucks, centres, tools, etc., for a great variety of work. Benches with vises are also provided for such work as chipping, filing, etc.

A thoroughly equipped tool room contains an ample stock of the best makes of small tools such as drills, taps and dies, milling cutters, reamers, gauges, micrometers, etc.

The following wood working tools are also provided in addition to benches for pattern making:—

One Pattern Maker's Lathe, 16 in. swing, 8 ft. bed, from Fay & Scott, Dexter, Me.

One 32 in. Band Saw from the Crescent Machine Co., Leetonia, Ohio.

One Iron Single Saw Bench, from the Crescent Machine Co., Leetonia, Ohio.

One Buzz Planer from W. W. Carey, Lowell, Mass.

POWER, LIGHT, HEAT AND VENTILATING PLANT

One 300 H. P. Aultman and Taylor Horizontal Water Tube Boiler, equipped with U. S. Rocking Grates.

Two 100 H. P. Stirling Water Tube Boilers.

These boilers are connected to a Sturtevant Induced Draft Apparatus, including fan, direct connected to the Sturtevant vertical engine and equipped with two way dampers. One of the Stirling Boilers is so piped that it may be cut off from the regular plant in order to supply the Engineering Laboratory only.

One Sturtevant Smoke Filtering Apparatus.

One Locke Steam Pressure Regulator for draft engine.

One Knowles Boiler Feed Pump, 6 in. x 4 in. x 6 in.

One Warren Webster Feed Water Heater, Filter and Oil Extractor.

One Payne 14 in. x 14 in. Automatic High Speed Engine of 125 H. P.

One 9 1-2 in. x 11 3-4 in. Nash Gas Engine of 50 H. P. of the four cycle type, with speed regulating clutch and hit and miss governor.

One Motor Driven Air Compressor 5 1-2 in. x 6 in. with a storage tank of 20 cubic feet capacity, 100 lbs. per sq. in. pressure.

One Complete Sturtevant Double Duct System for heating Southwick Hall. This apparatus is designed to provide the proper amount of fresh warm air called for by the State law as applied to educational institutions, and includes a 9 ft. x 4 ft. fan direct



ATHLETIC FIELD AND SCHOOL BUILDINGS

connected to the Sturtevant horizontal engine, drip tank and Knowles automatic return pump, 4 1-2 in. x 2 3-4 in. x 4 in. arranged to deliver either to the feed water heater or to the boilers direct.

Complete Ventilation System for Southwick Hall and Falmouth Street Building including 6 direct connected motor driven exhaust fans.

One Sturtevant Fan and Heater for Kitson Hall and Falmouth Street Building, direct connected to a Sturtevant inverted engine.

One Cross Oil Filter.

One Complete Moistening Apparatus installed by the American Moistening Co., Boston, Mass., including Knowles triplex 4 x 4 power pump, tank, and 20 moistening heads.

One Ingersoll-Rand 8 x 8 Steam Driven Air Compressor for use with Turbo Heads, installed in French Spinning Department, by the G. M. Parks Co., Fitchburg, Mass.

A Complete Sprinkler System for fire protection, using the Grinnell glass button heads.

One Bullock 75 K. W. Direct Current Multipolar Compound Generator, wound for 220 volts, over compounded 20 volts from no load to full load. This is direct connected to the Payne engine.

One Bullock 30 K. W. Generator of the same type, direct connected to the Nash gas engine.

The switchboard is arranged so that either unit may be thrown in independently on the power or lighting feeders or the two machines may be run in parallel. The lighting circuits are on the two wire 220 volt system and supply the equivalent of 1030—16 candle power lamps. The power circuits are on the same system and supply approximately 170 H. P. in motors.

Three 24 H. P. Bullock Motors.

One 20 H. P. General Electric Motor.

Two 10 H. P. Allis Chalmers Motors.

Two 7 1-2 H. P. General Electric Motors.

Four 15 H. P. Bullock Motors.

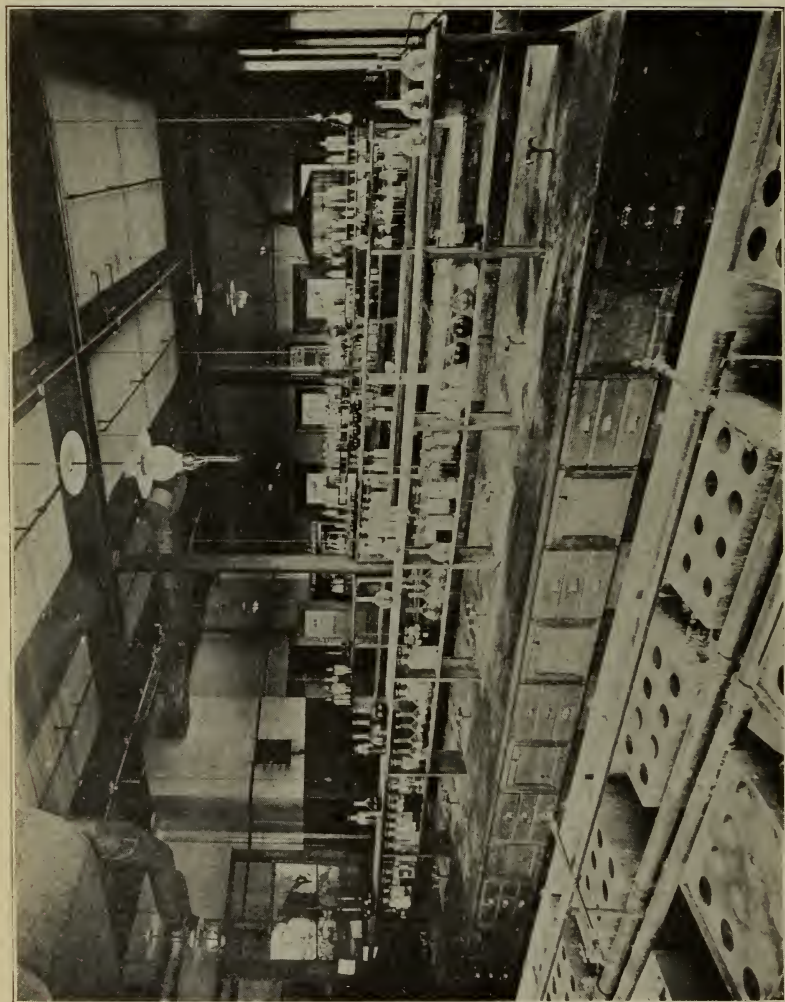
One 3 H. P. Motor, New England Motor Co.

One 2 H. P. Motor, Holtzer-Cabot Electric Co.

ATHLETICS

Through the generosity of Mr. Frederick Fanning Ayer, the school has been provided with a Campus and Athletic Field of about three acres. This has been carefully graded and laid out for base ball, foot ball and track athletics. Bleachers have been provided for use at the out-of-door games.

In the basement of Kitson Hall there has been provided a recreation room for the use of the students at such times as their attendance is not

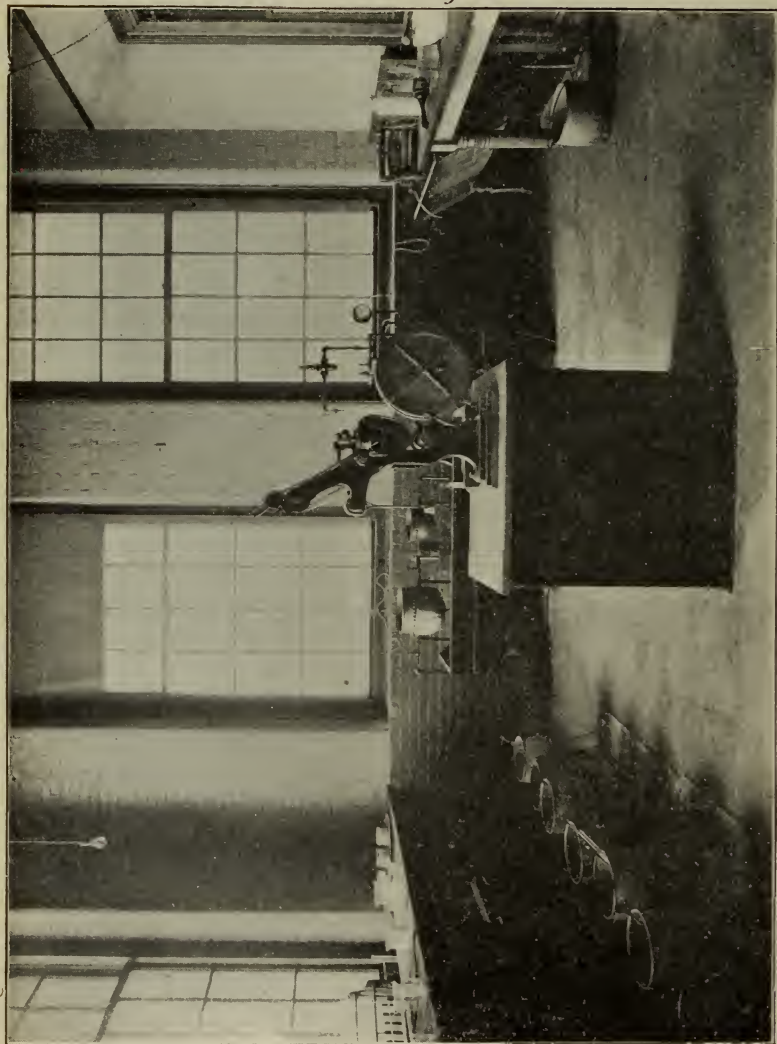


EXPERIMENTAL DYEING LABORATORY

required in classes. This room is also used by those who take part in athletics, and connected to it is a smaller room provided with shower baths, lockers and toilets. Both rooms are easily accessible to the Campus by way of the outer door of Kitson Hall.

The upper hall of Southwick Hall has been equipped with gymnastic apparatus. Chest weights, wooden dumb bells, Indian clubs, a set of travelling rings, a vaulting horse, parallel bars, a punching bag and several sets of foils and single sticks have been provided.

In order to be sure that no student having any dangerous physical weakness takes part in any athletic contest, all candidates for the various athletic teams are obliged to pass a satisfactory physical examination given by the Medical Adviser of the school. All students of this class must undergo a physical examination at the opening of the school year and again at the end of the physical training course in the spring. Records are kept and a comparison is made that progress during the year may be noted.



EXPERIMENTAL PRINTING LABORATORY

Day Classes

ENTRANCE REQUIREMENTS

Degree Courses

Candidates for admission to either of the degree courses must be graduates of a school approved by the New England College Entrance Certificate Board, and must present a certificate from the principal of the school, reporting upon the subject pursued and the points obtained according to the schedule of studies given hereafter. A total of fourteen points is required.

Required Subjects	POINTS
Plane Geometry	1
Algebra (I Elementary. II Advanced.)	2
Elementary German A (two years)	
or	
Elementary French A (two years)	2
English	3
American History	1
	<hr/>
	9

Elective Subjects	POINTS
Physics	1
Chemistry	1
Solid Geometry	1
Trigonometry	1
Mechanical Drawing	1
Mechanic Arts	1
English History	1
Advanced French or German (one year in addition to requirements of Elementary French A or Elementary German A)	1
English	1

A point represents satisfactory work in a year's study in a specified subject in a secondary school which is approved by the New England College Entrance Certificate Board, or by the Board of Regents of New York.

Diploma Courses

Candidates for admission to the Diploma Courses are accepted upon presentation of properly vouched certificates showing the completion of a regular four year course in a High School or Academy of reputable standing. The certificate must specify that the applicant has satisfactorily passed the necessary subjects. A total of nine points is required.



INDUSTRIAL CHEMISTRY LABORATORY

The subject matter covered should be the same as described under the required subjects for the Degree Courses with the exception of German, French and Arithmetic, the requirements for which are given specifically under Elementary German B, Elementary French B and Arithmetic (Diploma Course Requirements).

Required Subjects	POINTS
Plane Geometry	1
Algebra (I Elementary. II Advanced.)	2
Elementary German B (one year)	
or	1
Elementary French B (one year)	
English	3
American History	1
Arithmetic	1
	<hr/>
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ENTRANCE EXAMINATIONS

All students who are unable to present a certificate for either the degree, or diploma courses must pass entrance examinations. The examinations for admission to the diploma and degree courses will be held as follows:

Tuesday, June 18, 1912; Tuesday, September 10, 1912; Tuesday, June 17, 1913:

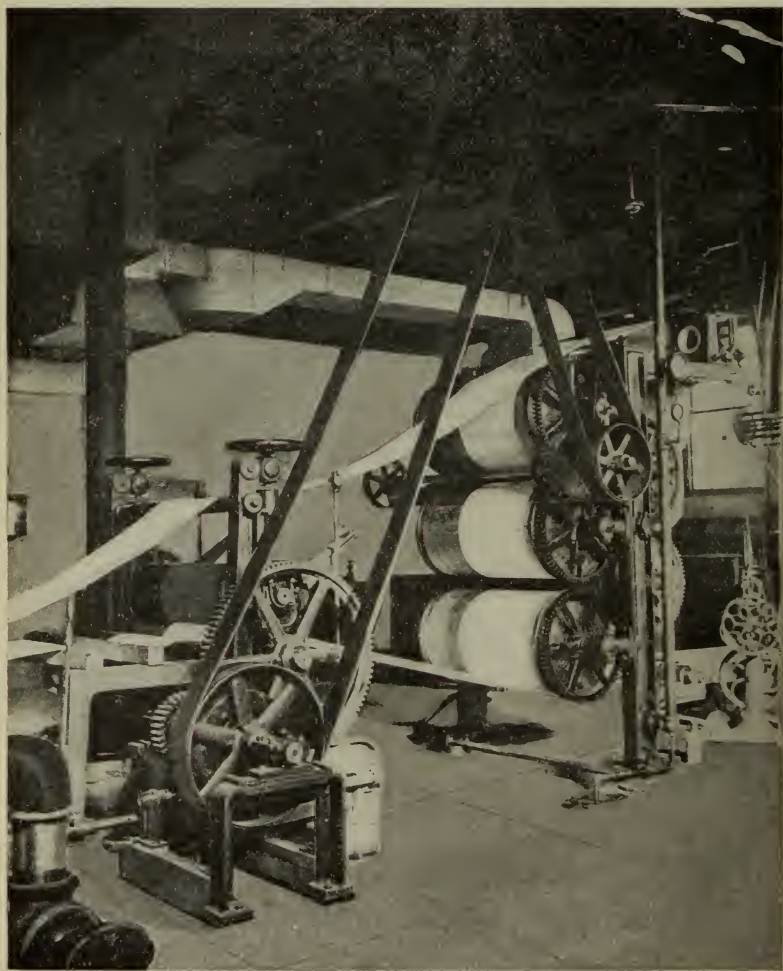
Algebra	9 A. M. to 11 A. M.
American History	11 A. M. to 1 P. M.
English	2 P. M. to 4 P. M.

Wednesday, June 19, 1912; Wednesday, September 11, 1912; Wednesday, June 18, 1913:

Plane Geometry	9 A. M. to 11 A. M.
German or French	11 A. M. to 1 P. M.
Arithmetic	2 P. M. to 4 P. M.

Applicants who wish to take the degree courses and cannot enter upon certificate must send to the Principal not later than June 10, for June examinations and September 1, for Fall Examinations, a list of the optional subjects which they offer for examination. The dates for these examinations will be immediately following those set for the required subjects, examinations for which will be held in accordance with the above schedule.

Candidates failing to pass the June examinations are allowed to try again in September; those who cannot attend the June examinations may present themselves in September.



VIEW IN COMMERCIAL DYEING LABORATORY

REQUIRED SUBJECTS FOR ENTRANCE

Algebra

I. Fundamental operations, factoring, determination of the highest common factor and least common multiple, fractions, simple and complex, simple equations of one or more unknown quantities, problems involving linear equation of either numerical or literal quantities, radicals, involution, and evolution, square and cube root, ratio and proportion, exponents including fractional and negative.

II. Quadratic equations both numerical and literal. Simple problems involving one or more unknown quantities that may be solved by the methods of linear or quadratic equations, binomial theorem for positive integral exponents, problems involving methods of arithmetical and geometrical progressions.

Plane Geometry

The usual theorems and constructions of good text books including the general properties of plane rectilinear figures, the circle and the measurement of angles similar polygons, areas, regular polygons, and the measurement of the circle. The solution of original problems and problems in mensuration of lines and plane surfaces.

Arithmetic

(Diploma Course Requirement)

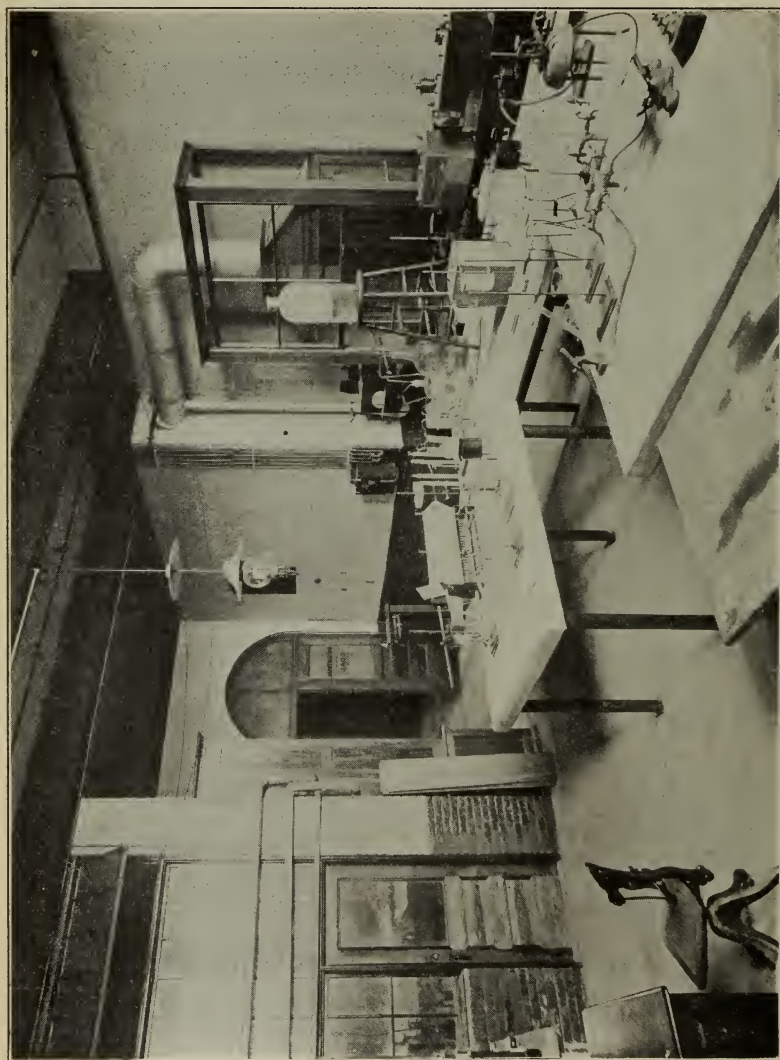
This subject should be pursued for two reasons: that the applicant may acquire familiarity with the fundamental principles and that he may acquire accuracy in solution. Special attention should be given to problems in percentage, interest, discount, square and cube root, alligation, ratio and proportion, Metric System.

English

As high schools, academies, and preparatory schools are following to a greater extent than heretofore, the requirements of the College Entrance Examination Board concerning the study of English Composition and Literature, the applicant to this school should be preparing for entrance examinations to conform to the suggestions of this Board.

The examination consists of two parts, both of which are given at the same time.

(a) With the object of testing the student's ability to express his thoughts in writing clearly and correctly he will be required to write upon subjects familiar to him. Emphasis will be laid upon the composition, punctuation, grammar, idiom and formation of paragraphs. He will be judged by how well he writes rather than by how much he writes.



FUEL AND OIL LABORATORY

(b) The second part of the examination is prepared with the view of ascertaining the extent of the student's knowledge of good literature.

For 1912 the following books have already been prescribed for careful reading and study.

Shakespeare's *Macbeth*.

Addison's *Sir Roger de Coverley Papers*.

Scott's *Ivanhoe*.

Thackeray's *Henry Esmond*.

De Quincey's *Joan of Arc* and *The English Mail Coach*.

Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and the *Passing of Arthur*.

Burke's *Speech on Conciliation with America*.

Carlyle's *Essay on Burns*.

For 1913, 1914, and 1915, the list of study books is as follows:

Shakespeare's *Macbeth*.

Milton's *L'Allegro*, *Il Penseroso* and *Comus*.

Either,

Burke's *Speech on Conciliation with America*.

or both of the following:

Washington's *Farewell Address*.

Webster's *First Bunker Hill Oration*.

Either,

Macaulay's *Life of Johnson*.

or

Carlyle's *Essay on Burns*.

Modern Languages

REQUIREMENTS FOR DEGREE COURSES

It is expected that the work in these subjects has covered a period of at least two years of preparatory school training or the equivalent. Importance should be given to ability to translate into good idiomatic English, but attention should also be paid to grammar and construction that greater care may be used in translation.

Elementary German A

The entrance examination is composed of two parts, both taken, however, at the same time.

(a) Translation of simple German prose into good idiomatic English.

(b) Questions to test proficiency in grammar and simple English sentences to be rendered into German.

The requirements include the declension of articles, adjectives, pronouns, and nouns; the conjugation and inflection of weak and strong verbs; the simpler uses of the subjunctive; the use of the modal



LECTURE ROOM—ENGINEERING DEPARTMENT

auxiliaries; the prepositions and their government; the principal parts of important verbs; the elementary rules of syntax and word order.

Among the texts recommended for prospective candidates are:

Andersen's Märchen.
Arnold's Fritz auf Ferien.
Baumbach's Die Nonna and Der Schwiegersohn.
Gerstäcker's Germelshausen.
Heyse's L'Arrabbiata.
Hillern's Höher als die Kirche.
Jensen's Die braune Erica.
Storm's Immensee.
Zschokke's Der zerbrochene Krug.

Elementary French A

The entrance examination is composed of two parts, both taken, however, at the same time.

- (a) Translation of simple French prose into good idiomatic English.
- (b) Questions to test proficiency in grammar and simple English sentences to be rendered into French.

The requirements include the principal parts, conjugation and inflection of the regular and the more common irregular verbs; the singular and plural forms of nouns and adjectives; the uses of articles and partitive construction; the forms and positions of personal pronouns; and the simpler uses of the conditional and subjunctive.

Among the texts recommended for prospective candidates are:

About's Le roi des montagnes.
Bruno's Le tour de la France.
Daudet's easier short tales.
De la Bédollière's La mère Michel et son chat.
Eckmann—Chatrian's Madame Thérèse.
Foa's Contes Biographiques.
Halévy's L'Abbé Constantin.
Merimée's Colomba.
Extracts from Michelet.
Sarcey's Le siège de Paris.
Verne's Le tour du monde en quatre-vingts jours.

REQUIREMENTS FOR DIPLOMA COURSES

Elementary French B

Applicants who enter for one of the three year courses may present one year's work in French in a preparatory school. Those who present themselves for examination in this subject should be familiar with the rudiments of grammar and be able to translate simple French prose into good idiomatic English, also to translate into French, English sentences based on the French given for translation.



MECHANICAL DRAWING ROOM

Elementary German B

Applicants who enter for one of the three year courses may present one year's work in German in a preparatory school. What is stated in regard to French applies to those who may present German instead of French.

American History

Applicants must show familiarity with the early settlements in America, the colonies, their government, the customs of the people and events which led to the establishment of the United States. They should be informed concerning the causes and effects of the principal wars in which the country has been involved. Applicants should be prepared to consider questions requiring a knowledge of Civil Government as well as historical facts connected with the growth of this country up to the present time.

ELECTIVE SUBJECTS

English History

The usual course of one year as offered by preparatory schools will be sufficient preparation for this requirement. Applicants should be particularly familiar with such events of English History as have any bearing upon the history of the United States.

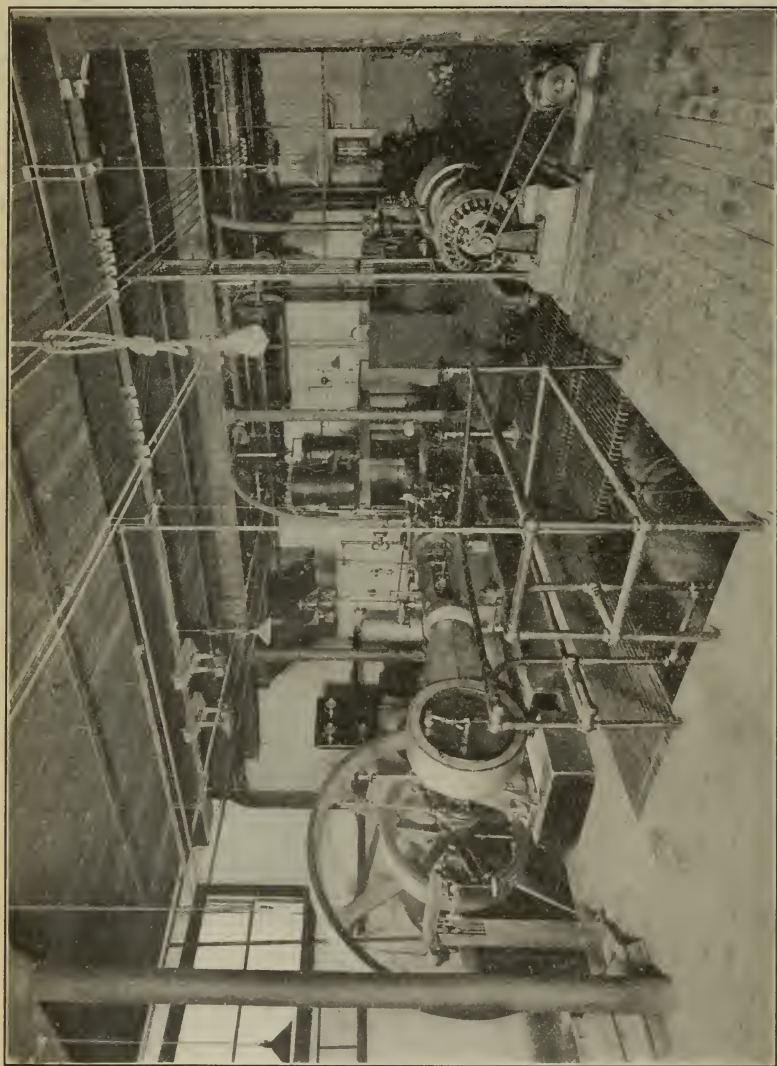
Physics

The applicant should be familiar with the fundamental principles of Physics, particularly those considered under the headings of Mechanics, Heat, Light, Electricity and Magnetism. Text book instruction should be supplemented by lecture table experiments. Wherever possible, the student should pursue a laboratory course, but for the present no applicant will be conditioned in this subject if he has not been able to carry on a laboratory course. Where a laboratory course is offered by a preparatory school, it should cover at least twenty-five of those experiments listed in the syllabus of the College Entrance Examination Board. An applicant should present his note-book together with the certificate from the teacher under whom the work was performed.

Chemistry

Applicants must show evidence of their familiarity with the rudiments of Chemistry. Any course given in a preparatory school organized to present instruction by means of text book or lectures together with co-related laboratory work will be considered as covering the requirements. The applicant's note book with his original notes including description of experiments, apparatus used, reaction, observation, and deductions, must be accompanied by his instructor's certificate.

Importance will be placed upon manipulation and deductions as well as the general appearance and neatness of the note-book.



ENGINEERING LABORATORY

Solid Geometry

The usual theorems and constructions of good text books including the relations of planes and lines in space, the properties and measurement of prisms, pyramids, cylinders, and cones; the sphere and spherical triangles. The solution of original problems and the applications of the mensuration of surfaces and solids.

Trigonometry

The usual courses of instruction covered by the standard text books on Plane and Spherical Trigonometry will prepare an applicant sufficiently to meet this requirement.

Mechanical Drawing

The applicant must have pursued such a course in Mechanical Drawing that he will be familiar with the usual Geometrical Construction, Problems, Projection of Points, Lines, Planes, and Simple Solids.

Importance is laid not only upon the accuracy with which the work is performed but upon the general arrangement, appearance, and care with which the plates are executed.

Applicants are advised not to offer this subject as equivalent of the first term's work at the school.

Mechanic Arts

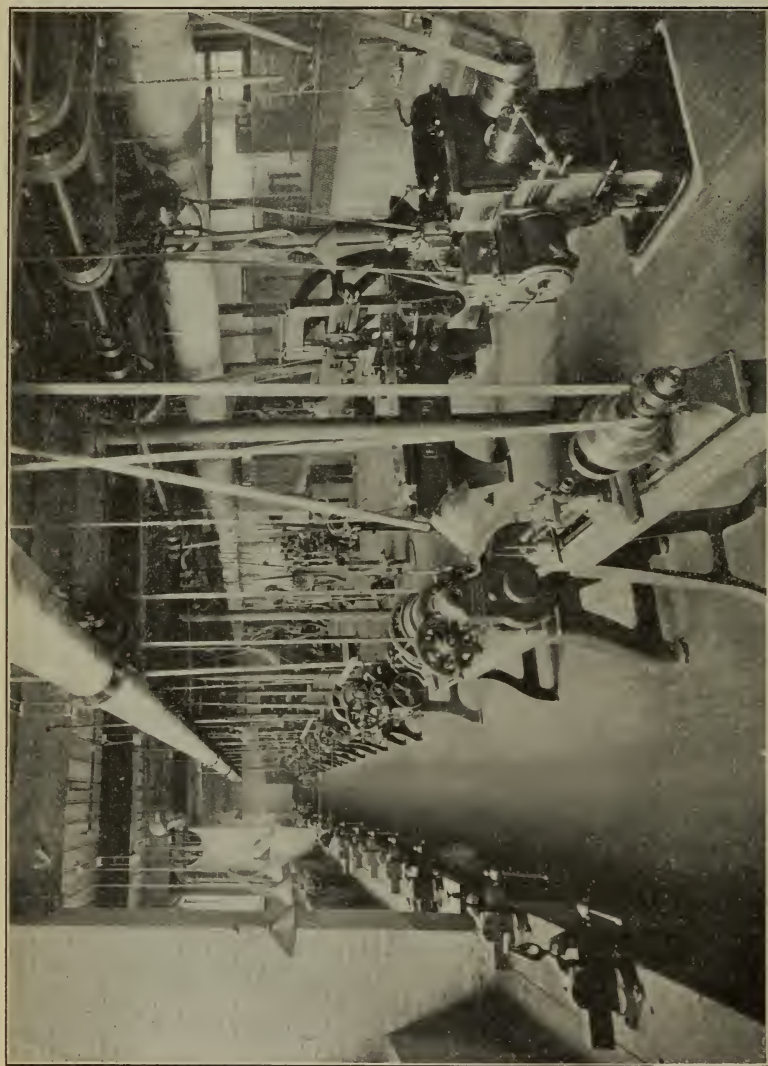
The usual courses offered by properly equipped preparatory schools will be accepted as suitable fulfilment of this requirement. Work should include instruction in the handling of both wood and metal working tools in the more simple practices of these arts.

Advanced French or German

In cases where applicants have pursued courses in French or German for more than two years, and have completed work which is more advanced than is included under Elementary French or German, they may offer the additional year as an elective. Those who present either of these subjects for examination must also pass the Elementary Examination in the same subject. The examination will consist of the translation from either French or German to English and vice versa, of subject matter which is more advanced than that described under Elementary French and Elementary German.

English

In many preparatory schools this subject is required during all of the four years, and where it is pursued to this extent the applicant may offer the additional year's work as one of his elective subjects.



MACHINE SHOP

GENERAL INFORMATION

Preparation

Particular stress is laid upon a thorough grounding in mathematics including Algebra, Arithmetic and Plane Geometry, as these form the basis upon which the work of this school rests. While Solid Geometry is not required at the present time, the student will find a knowledge of this subject very valuable in his subsequent work and is strongly recommended to include this subject as one of his electives. A preliminary course in science, including Physics and Chemistry, serves to prepare the student's mind for the higher branches of these subjects and their application, but neither will be considered as the equivalent of the courses in these branches given in the school.

Advanced Standing

Candidates who may have received previous training in any of the subjects ordinarily taken in the regular course may present themselves for examination as per calendar. If a satisfactory rank be attained, they may elect such further work as their preparation will permit.

Attendance Card

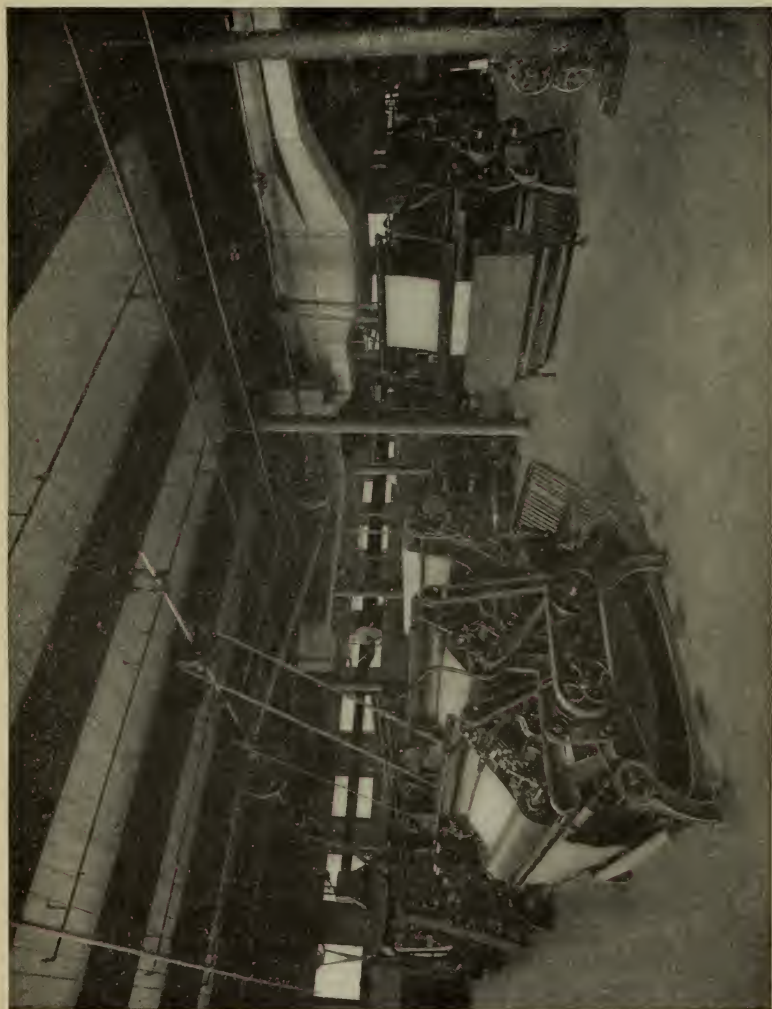
At the beginning of each term all students must fill out and file with the Principal on blank forms which are provided, a formal application for such subjects as are required in his course and for which he is sufficiently prepared, subject to the approval of the Principal. When an attendance card is once approved, no change can be made except through the Principal.

Application Blanks

A blank form of application for admission may be found at the end of this bulletin. This should be properly filled out by all applicants whether entering upon certificate from a preparatory school or presenting themselves for examinations.

Fees

The fee for the day course is \$105 per year for residents of Massachusetts, with the exception of the Chemistry and Dyeing Course, for which the fee is \$130 for Second and Third Year students. For First Year students taking the Chemistry and Dyeing Course the first term fee is \$63 and the second term fee \$54.50. For non-residents the fee for all courses is \$155 per year. The fee for students from foreign countries is \$305 per year.



FINISHING DEPARTMENT

Three-fifths of the fee is charged for a single term and is payable on or before October 10, the balance on or before February 10, of each year. *No bills will be sent.* Students attending but one term will be charged three-fifths of the yearly fee. After payment is made, no fee or part thereof can be returned, except by special action of the Trustees.

Special students pay, in general, the full fee, but if a course be taken involving attendance at the school during a limited time, application may be made to the Principal for a reduction.

Students must provide their own books, stationery, tools, etc., and pay for any breakage or damage that they cause. The above fee includes free admission for any day student desiring to attend any of the evening classes in which there is accommodation.

For all first year students a minimum deposit of \$20 is required to cover the cost of breakage in the chemical laboratory, the unexpended balance to be returned to the student at the end of the year.

For all students in second or third years taking work in Chemistry or Dyeing Laboratories a deposit of \$15 per term is required. The unexpended balance will be returned at the end of the year.

Fees are strictly payable in advance, and students whose fees remain unpaid after the above mentioned dates will not be admitted to classes.

All deposits must be made before students can be admitted for laboratory work.

Examinations

Examinations are held at the end of each term.

In general, the examinations cover the work of the preceding term, but at the end of the third year, candidates for diplomas may be examined on all of the preceding three years' work.

Examinations for students conditioned in first term subjects are held in May and examinations for students conditioned in the Final Examinations are held in September following.

If a student fails to clear a condition at the time appointed, he will be required to repeat or drop the subject; and he cannot be admitted to subjects dependent thereon.

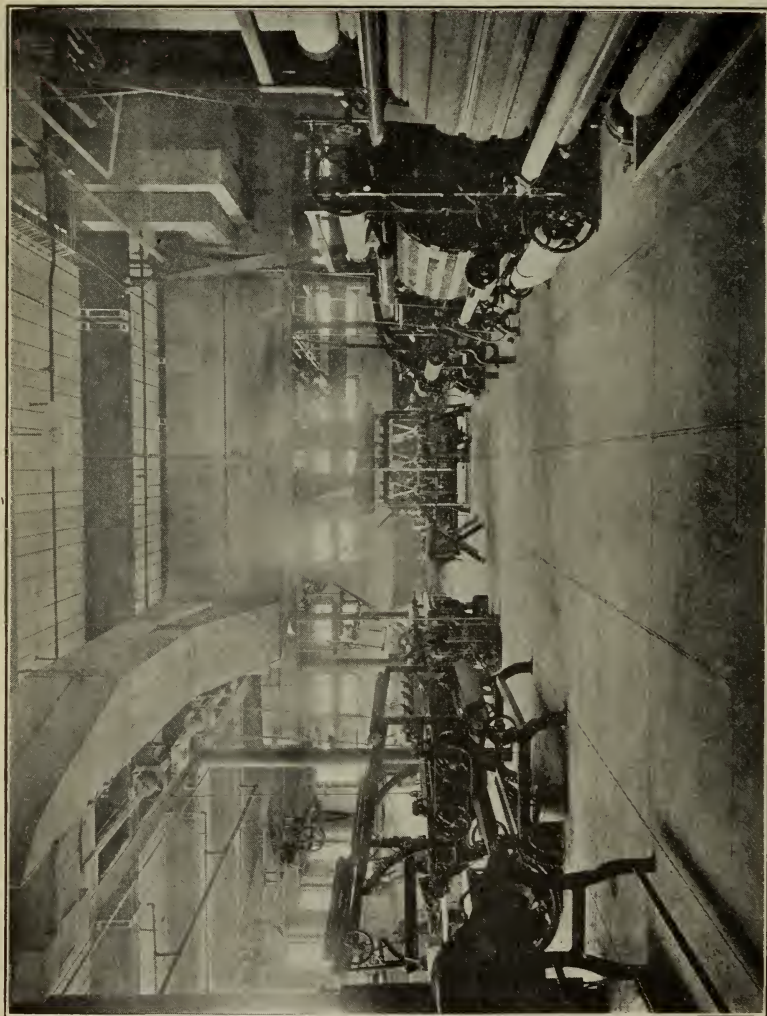
Intermediate examinations are held every five weeks and these serve to inform the student concerning his standing and the progress made.

Daily work and regularity of attendance are considered in making up the reports of standing.

Continued or persistent absence or tardiness from the classes is considered reason to exclude a student from the class.

Records and Reports of Standing

Twice during each term informal reports are sent to all parents or guardians and to students who are of age; and at the end of each term formal reports are made.



FINISHING DEPARTMENT

The daily work of the student forms an important part of his record, and no pupil will be awarded the diploma unless this portion of his record is clear.

Books are prescribed for study, for entry of lecture notes and other exercises, and are periodically examined by the lecturers. The care and accuracy with which these books are kept are considered in determining standing.

Thesis

All candidates for the degrees of the school must file with the Principal not later than May 15, a report of original investigation, or research, written on a good quality of paper, 8 x 10 inches, with one inch margin at left, and 1-2 inch at right of each page; such thesis to have been previously approved by the head of the department in which it is made.

For all candidates for the diploma in June, 1912, a similar thesis will be required, and in June, 1913, 1914 and 1915 this requirement for three year graduates will be optional on the part of the school.

Graduate Course

Graduates of technical courses of other schools are invited to communicate with the Principal with reference to special courses in the textile studies. Previous training in the engineering branches will usually reduce materially the time necessary to complete any of the courses at this school. The advantages offered to such persons for special research work are unexcelled, and a most profitable course may be arranged.

Special Awards of Merit

For several years a friend of the school has offered prizes in the form of books to be awarded to the successful candidates on graduation day. The prizes are continued each year. The conditions in detail are as follows:

First:—Ten dollars to the student taking the regular Chemistry and Dyeing Course who shall be considered as having attained the highest scholarship in First Year Chemistry.

Second:—Five dollars to the student taking the regular Chemistry and Dyeing Course who shall be considered as having attained the second highest scholarship in First Year Chemistry.

Third:—Ten dollars to the regular student of the Chemistry and Dyeing Course who shall be considered as having attained the highest scholarship during his second year.

Fourth:—Five dollars to the regular student of the Chemistry and Dyeing Course who shall be considered as having attained the second highest scholarship during his second year.



VIEW OF MANUFACTURED MATERIALS

Fifth:—Twenty dollars to the regular student in the Chemistry and Dyeing Course who shall present the best Thesis preparatory to graduation.

The above mentioned sums are to be invested in books which may be selected after graduation. In case no one is considered as being worthy of any particular scholarship prize, the same may be withheld. The decision in such case shall rest with the judges.

Prize Offers for Textile Designs

The Arlington Mills make the following prize offers for textile design to all members of the day classes, providing that there are at least two contestants, and to all members of the evening classes, providing that there are at least two contestants:

First and second prizes will be given to the winners in each contest.

First:—Cash prize of \$25.00 to the student who presents the best design with full specifications which is suitable for worsted dress goods fabrics for women's wear.

Second:—Cash prize of \$15.00 to the student who presents the second best design, with full specifications, applicable to the above fabrics.

Any contestant may present not more than five different designs for any one of the above mentioned fabrics.

No contestant will be eligible for more than one prize.

Specifications should be made upon standard thesis paper. Only one side should be used and subject matter should be either typewritten or presented in a clear legible handwriting. With each design a statement must be submitted telling the kind of fabric and finish intended.

Any or all designs submitted may be retained by the donors and may become their property.

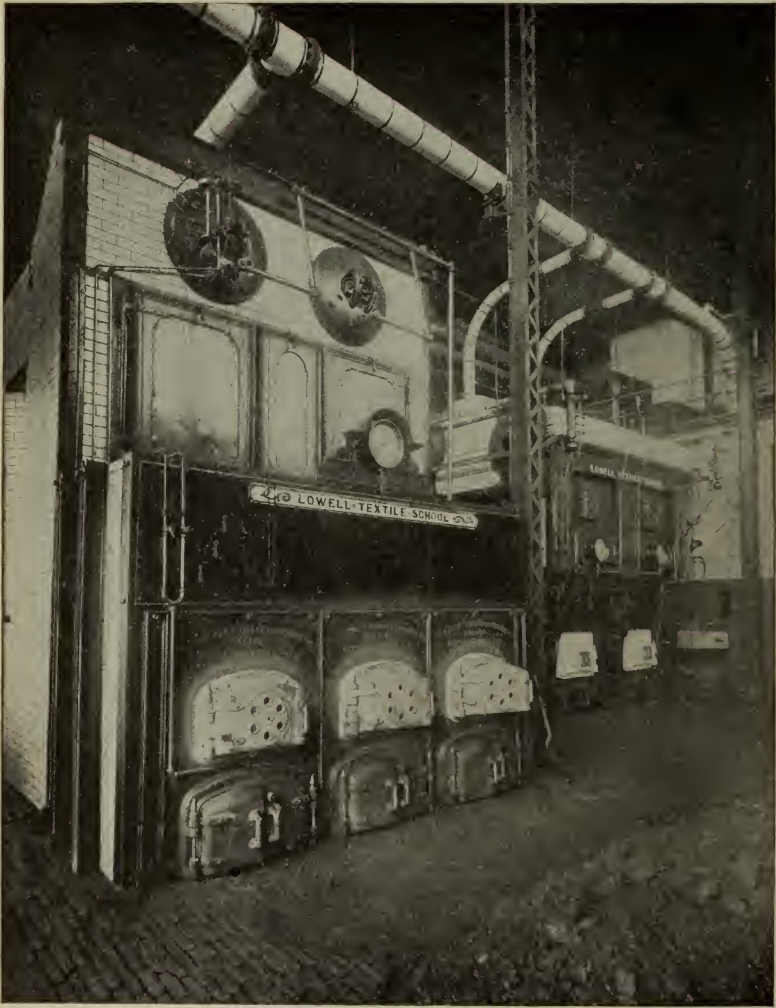
The judges will be appointed by the Arlington Mills.

All designs must be delivered to the Arlington Mills, 78 Chauncy Street, Boston, on or before May 15, accompanied by a sworn statement that the contestant has received no help and that the designs are entirely his own work, the object of the contest being to develop originality in the student.

The full name of a contestant must appear on the designs and specifications. In judging the relative merit of the various designs the neatness and care with which they are executed will be considered as well as the value of the designs from a manufacturer's point of view.

Degrees

The degree of Bachelor of Textile Engineering will be awarded for the completion of the four-year course in Textile Engineering. The degree of Bachelor of Textile Dyeing will be awarded for the completion of the four-year course in Chemistry and Textile Coloring.



BOILER ROOM

Diploma

For the present the diploma of the School will be awarded upon the satisfactory completion of any one of the regular courses, covering not less than three years, except where entrance is to advanced standing. In such cases at least one year's attendance is required.

Medals of Honor

The National Cotton Manufacturers' Association offers annually a medal to that member of the third year class who shall have during his course attained the highest standing in the specified subjects required by the vote of the association.

Attendance

All regular students must attend all exercises of their course. Special students must attend exercises as per their Tabular View.

In case of absence explanation must be made to the instructor or the Head of the Department. The effect of such absence upon a student's standing in the respective study will rest with the Head of the Department, subject to the approval of the Principal.

If a student absents himself from any department to such an extent that in the mind of the Head of the Department he is endangering his standing, he shall be reported to the Principal.

If he continues his non-attendance, he may be required to drop the subject and repeat it the following year.

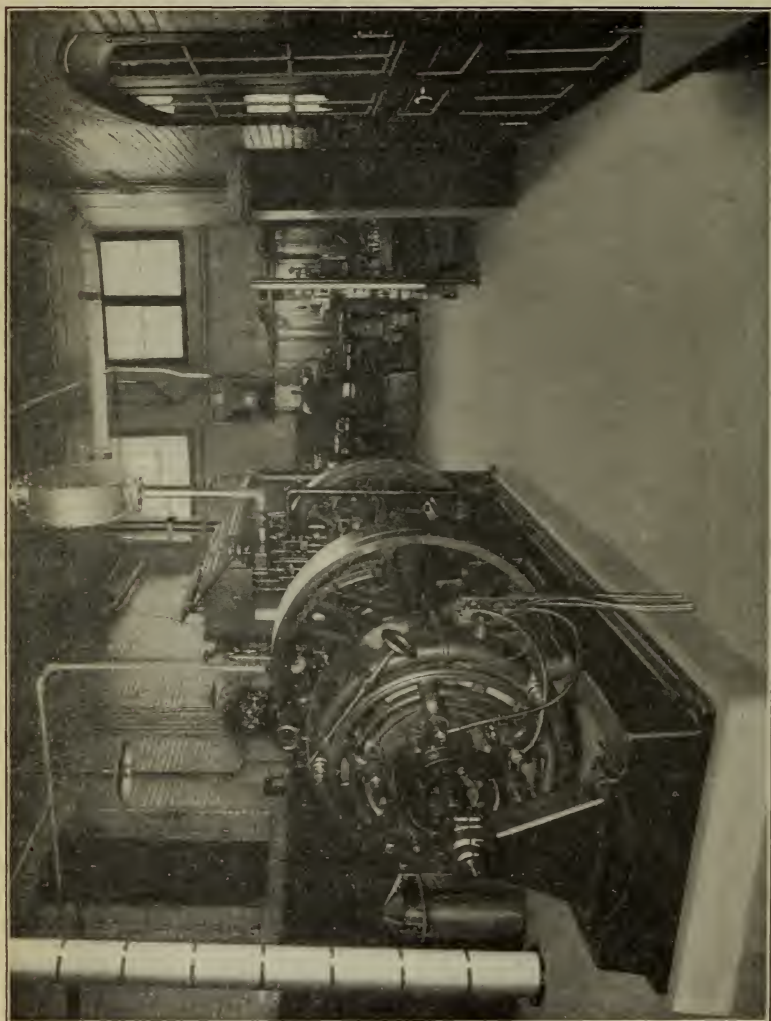
If he is reported from several departments on account of non-attendance, he may be suspended from the school for the remainder of the school year.

Conduct

Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order. All breakages, accidents, or irregularities of any kind must be reported immediately to the head of the department, or instructor in charge.

In cases of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly or ungentlemanly conduct or general insubordination, are considered good and sufficient reason for the immediate suspension of a student, and a report to the Trustees for such action as they deem necessary to take.

It is the aim of the Trustees so to administer the discipline of the school as to maintain a high standard of integrity and a scrupulous regard for trust. The attempt of any student to present as his own, work which



GAS ENGINE UNIT—ENGINE ROOM

he has not performed, or to pass any examination by improper means, is regarded by the Trustees as a most serious offense and renders the offender liable to immediate suspension or expulsion. The aiding or abetting of a student in any dishonesty is also held to be a grave breach of discipline.

Any student who violates these provisions will be immediately suspended by the Principal and the case reported at the following meeting of the Trustees for action.

Young men abounding in vitality when suddenly cut loose from home and established social environment to acquire an education at a residential school, need especially the careful direction of more mature minds in the formation of new associations. The managements of all residential schools are aware that this fact is the cause of considerable anxiety on the part of parents and guardians. The responsibility thus placed upon those under whose care these pupils are committed is profoundly recognized.

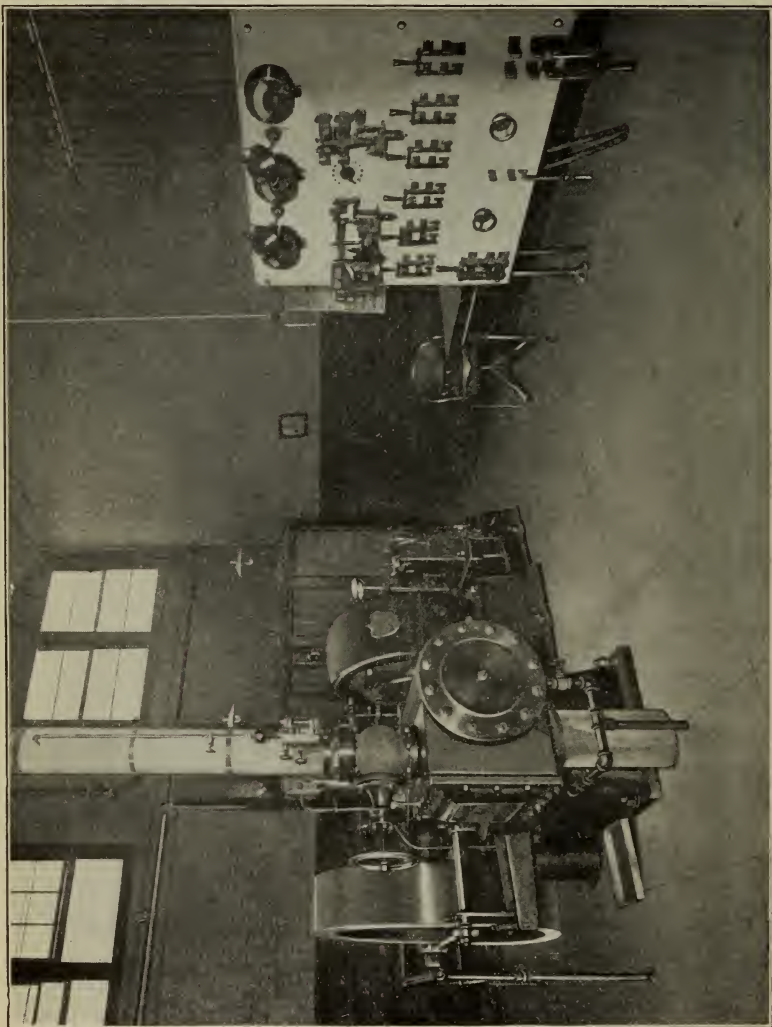
The public schools are for boys and girls, the college for youth, the higher technical and professional schools of medicine, law, engineering, etc., are for men. It is now fully recognized that the fundamental idea of the general educational system, from the kindergarten to the college inclusive, should be the development and establishment of character, and it is therefore expected that those entering the technical schools will have made some progress in self-respect, self-denial and self-control. They enter substantially upon their life work when they matriculate at the higher technical schools and may be placed on their honor as to conduct and not be subject to an irritating and humiliating system of espionage outside of school hours.

In place of such espionage it is the policy of technical schools to rely mainly upon the discipline of the work of the course in connection with facilities for physical exercise in the various athletic games and sports, for which ample provision has been made at this school.

Pupils often err in conduct from thoughtlessness and lack of experience rather than through wilfulness, and unconsciously fall into bad habits because of the lack of intelligent warning and instruction. For this reason, it is proposed to give thorough instruction by lectures, covering the subjects of hygiene, the preservation of physical vigor, morals, thrift and the duties of citizenship. A careful scrutiny will also be maintained by the instructing staff in order to detect in the students any tendency of relaxation in the work or attendance, and all reasonable effort will be made to maintain a high standard of scholarship and morals.

Library

The school library is supplied with leading textile books and with works dealing with science, art or industries allied to the textile trades. The leading textile papers are kept on file.



STEAM ENGINE UNIT—ENGINE ROOM

Sessions

The regular school sessions are in general from 8.30 a. m. to 12.30 p. m., and from 2 to 4.30 p. m., except Wednesdays and Saturdays when there is no session of the school in the afternoon. On Saturday afternoons the buildings are closed.

A tabular view designates the hours at which the various classes meet. This is rigidly adhered to and the student is marked for his attendance and work as therein scheduled.

Residence and Expenses

Students from a distance, requiring rooms and board in the city, may if they desire, select the same from a list which is kept at the School. The cost of rooms and board in a good district is from \$6.50 per week upwards.

All raw stock and yarn provided by the School, and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student is allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated in accordance with the requirements of the school. It is understood that the Trustees may retain in the School such specimens of student's work as they may determine.

Lockers are provided for the use of the students, sufficiently capacious to contain clothing, books and tools. The student must provide a good padlock with duplicate keys, one of which must be delivered at the school office where it will be preserved for use while the student remains at school.

No books, instruments, or other property of the School are loaned to the students to be removed from the premises except by special permission.

Awards

Gold Medal, Paris Exposition, 1900, for general excellence. A special Medal, Merchants and Manufacturers Exposition, Boston, 1900. The Pan-American Medal awarded to the School, 1901. Gold Medal, Louisiana Purchase Exposition, 1904, Gold Medal, Lewis and Clarke Centennial Exposition, 1905.

Bulletins and Catalogue

All students registering and paying the regular fee for the course selected are entitled to the Bulletins and Catalogues when issued.



LIBRARY

Courses of Instruction

These are especially intended for those who contemplate entering the business of textile manufacturing in any branch. The courses are sufficiently complete to enable one to start without previous acquaintance with textiles; but at the same time those who have been engaged in such business and wish to improve their knowledge and experience, can with profit pursue a course of study at the school.

Since the establishment of the school the regular diploma courses have been three years in length, and until further notice these will be continued. With the approval of the State Board of Education and the authority of the Legislature there are now offered two four-year courses leading to degrees of Bachelor of Textile Engineering (B.T.E.) and Bachelor of Textile Dyeing (B.T.D.). These will be open to all students entering with the proper qualifications in September, 1912, and thereafter. All students now attending the school who are able to meet these entrance requirements are eligible to the degree courses. They will be credited with all work they have pursued in the school that is equivalent to the requirements of the degree courses. The diploma will be granted for the successful completion of such work as is the equivalent of the present three year courses.

Students entering in September, 1912, may elect either a three year or a four year course, but it is hoped that students planning to enter in succeeding years will arrange and prepare for the four year courses.

For the benefit of those entering this year for a three year course the descriptions and schedules are given.

There is one year of preliminary instruction which is common to all courses. Students electing the Course in Chemistry and Dyeing or the Course in Chemistry and Textile Coloring must make the selection at the commencement of the second term of the first year. Other students are not required to choose their courses until the end of the first year.

The four year degree courses are:

Textile Engineering.
Chemistry and Textile Coloring.

With the former are offered three textile manufacturing options, viz.:

1. General Textile
2. Cotton Manufacturing
3. Wool Manufacturing

Each of these courses is planned to train one in the fundamental principles of science found to be applicable in the particular fields of Textile Chemistry and Textile Engineering. It is maintained that for one to be successful in either of these important branches of industry,

as thorough and broad a training is required as in any of the recognized branches of engineering or of applied industrial science.

With this in mind these courses have been built of a secure framework of science and mathematics, and to it has been added the useful application of those branches in the broad textile field. With the direct purpose of laying a secure foundation in the training, a more extended and advanced preparatory course is first demanded, and subsequently in the school work more subjects of a general character are included that narrowness of judgment and observation may not result by over stimulation of the technical development.

For those who wish to devote special work to textile manufacturing in some one branch and either do not care or are not in a position to carry on the work for four years, the three year manufacturing courses are advised. As it is not expected that students taking these courses will be candidates for a degree, should they remain four years, the entrance requirements are not of the grade required of those who enter for either of the degree courses.

It will, however, be possible for one who enters for one of the manufacturing courses with a preparation demanded for the degree courses, to elect at some time in his work at the school, the four year degree course. In that event considerable extra work would be required to cover, not only the additional subjects of the fourth year, but also to make up the subjects omitted in the earlier years of the course.

Until further notice diplomas will be awarded for three year courses in:

- Cotton Manufacturing
- Wool Manufacturing
- Textile Design (General Textile Course)
- Chemistry and Dyeing
- Textile Engineering

COURSES FOR WOMEN

Although all classes are open to women the courses which have appealed especially to their tastes have been Textile Designing and Decorative Art. Some have pursued courses in Chemistry and have added to their work in Design some instruction in Power Weaving and Finishing. These special courses have in general been followed for three years and in some cases have led the students to positions either in the mill office or in some commercial lines that have been desirable and have offered congenial work.

As the school work is usually special to meet the needs of each case, no prescribed course of study is given in this catalog. Inquiries should be made of the Principal.

Courses

In the column headed "Hours of Exercise" the numbers represent for each particular subject the total hours required for a period of fifteen weeks.

The letter and number which follow the subjects indicate the department in which the subject is given and the number of the subject in that department. For detail description of the same, see page 115.

The departments are indicated as follows:

Textile Engineering	B	Cotton Yarns	F
Chemistry and Dyeing	C	Woolen and Worsted Yarns	G
Textile Design and Power		Finishing	H
Weaving	D	Physical Culture	I
Languages and History	E		

By referring to the letter and number indicated under "Preparation" the student can ascertain what subjects are necessary in order that he may have a clear understanding of the subject which he is scheduled to take.

FIRST YEAR

FIRST TERM

(Common to all courses)

	Hours of Exercise
Mechanism B-3	60
Mechanical Drawing B-7	60
Mathematics B-1	45
Textile Design D-1	60
Elementary Chemistry C-1	150
English E-1	30
Elementary German E-2 or Elementary French E-4	45
Physical Culture I-1	30

SECOND TERM

	Courses I-4, I-3, II-3, III-3, VI-3	Courses II-4, IV-3
Mechanism B-3	60	60
Mechanical Drawing B-7	75	37
Mathematics B-1	45	45
Textile Design D-1	75	—
Elementary Chemistry C-1	75	75
English E-1	30	30
Elementary German E-2 or Elementary French E-4	45	45
Physical Culture I-1	30	30
Qualitative Analysis C-2	—	157
Stoichiometry C-3	—	30

COURSE I-4.—TEXTILE ENGINEERING

At the organization of the school four major courses were offered, but with the growth of the school a demand was felt for instruction in those branches which pertained entirely to the Engineering Department. It was recognized that there was a field of engineering which had thus far received little or no attention from institutions for technical education. The field appeared to offer breadth and opportunities for those who have engineering inclinations and who also have a thorough knowledge of textile processes and machines.

The success of the three year course first planned has brought new problems which require additional instruction and time. This need, together with the scientific character of the work has justified the extension to four years and the granting of the degree of B. T. E.

The subjects of the first year which are substantially the same for all courses are intended to lay the foundation for the subsequent dependent instruction in the applied courses. Hence, the subjects of Mathematics, Chemistry, Mechanism, and Mechanical Drawing not only operate to develop the mind and stimulate accurate thinking, but also set forth the principles which are later to be used in a clear understanding of machines and methods. The course in Elementary Designing acquaints the student with textile fabrics and their construction, while the subjects of English and one foreign language give the student a better understanding of his own language that he may express himself clearly, and by acquaintance with a foreign language he may obtain information not available in his own tongue.

In the second year instruction in Cotton Yarn Manufacture is carried on and this is followed in the third and fourth years by Wool Manufacturing, Weaving, and Finishing. Chemistry of the first year develops into Textile Chemistry and Dyeing of the second year, and during this year an advanced course of Physics is given, leading to Electrical Engineering and its application in the textile industry. Mathematics are finished with the second year and during the two year course the branches of higher Algebra, Trigonometry, Analytical Geometry, and Calculus are studied with particular reference to the solution of engineering problems, particularly in the subjects of Applied Mechanics, Electrical, Heat, and Mill Engineering, which are a part of the second, third, and last years' work.

German or French is continued into the second year, and the study of Economics in the third year gives breadth to the technical development of the other branches. In the fourth year the course of Business Administration is aimed to bring the student into closer relation with general business system and it is proposed to include under this head courses in Accounting, Business Law, Scientific Management, Banking, etc.

For detailed description of the subjects see pages 115-150.

COURSE I-4.—TEXTILE ENGINEERING

General Textile Option

(For First Year see page 97)

SECOND YEAR

FIRST TERM			
	Hours of Exercise		Hours of Exercise
Textile Chemistry and Dye- ing	C-9 30	Weaving Mechanism	B-5 30
Physics	B-11 30	Pattern Shop	B-16 45
Mathematics	B-2 60	Cotton Yarn Manufacture	F-1 105
Applied Mechanics	B-4 30	Advanced German or French	E-3-5 45
Machine Drawing	B-8 45	Industrial History	E-6 30
Mechanical Laboratory	B-6 30		

SECOND TERM			
Textile Chemistry and Dye- ing	C-9 30	Pattern Shop	B-16 45
Physics	B-11 30	Cotton Yarn Manufacture	F-1 105
Mathematics	B-2 60	Power Weaving	D-9 30
Applied Mechanics	B-4 30	Advanced German or French	E-3-5 45
Machine Drawing	B-8 45	Industrial History	E-6 30
Mechanical Laboratory	B-6 30		

THIRD YEAR

FIRST TERM			
Steam Engineering	B-12 60	Woolen and Worsted Yarn Manufacture	G-1 120
Electrical Engineering	B-20 30	Power Weaving	D-9 45
Machine Drawing	B-10 75	Economics	E-7 30
Physical Laboratory	B-19 30		
Machine Shop Practice	B-15 60		

SECOND TERM			
Hydraulics	B-13 30	Woolen and Worsted Yarn Manufacture	G-1 150
Electrical Engineering	B-20 30	Power Weaving	D-9 45
Machine Drawing	B-10 75	Economics	E-7 30
Power Plants	B-18 30		
Machine Shop Practice	B-15 60		

FOURTH YEAR

FIRST TERM			
Mill Engineering	B-17 75	Cotton Finishing	H-2 30
Engineering Laboratory	B-14 30	Woolen and Worsted Finishing	H-1 30
Electrical Engineering	B-20 60	Power Weaving	D-10 30
Machine Shop Practice	B-15 60	Business Administration	E-8 45
Woolen and Worsted Yarn Manufacture	G-1 90		

SECOND TERM			
Mill Engineering	B-17 75	Woolen and Worsted Finishing	H-1 60
Engineering Laboratory	B-14 30	Business Administration	E-8 45
Electrical Engineering	B-20 60	Thesis	120
Machine Shop Practice	B-15 60		
Cotton Finishing	H-2 60		

COURSE I-4.—TEXTILE ENGINEERING

Cotton Option

(For First Year see page 97)

SECOND YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Textile Chemistry and Dye- ing	C-9 30	Weaving Mechanism	B-5 30
Physics	B-11 30	Pattern Shop	B-16 45
Mathematics	B-2 60	Cotton Yarn Manufacture	F-1 60
Applied Mechanics	B-4 30	Cotton Design	D-2 45
Machine Drawing	B-8 45	Advanced German or French	E-3, 5 45
Mechanical Laboratory	B-6 30	Industrial History	E-6 30

SECOND TERM

Textile Chemistry and Dye- ing	C-9 30	Pattern Shop	B-16 45
Physics	B-11 30	Cotton Yarn Manufacture	F-1 60
Mathematics	B-2 60	Cotton Design	D-2 45
Applied Mechanics	B-4 30	Power Weaving	D-9 30
Machine Drawing	B-8 45	Advanced German or French	E-3, 5 45
Mechanical Laboratory	B-6 30	Industrial History	E-6 30

THIRD YEAR

FIRST TERM

Steam Engineering	B-12 60	Cotton Yarn Manufacture	F-1 105
Electrical Engineering	B-20 30	Cotton Design	D-6, 7 45
Machine Drawing	B-10 45	Power Weaving	D-9 45
Physical Laboratory	B-19 30	Economics	E-7 30
Machine Shop Practice	B-15 60		

SECOND TERM

Hydraulics	B-13 30	Cotton Yarn Manufacture	F-1 105
Electrical Engineering	B-20 30	Cotton Design	D-6, 7 45
Machine Drawing	B-10 45	Power Weaving	D-9 45
Power Plants	B-18 30	Economics	E-7 30
Machine Shop Practice	B-15 60		

FOURTH YEAR

FIRST TERM

Mill Engineering	B-17 75	Cotton Design	D-6, 7 45
Engineering Laboratory	B-14 30	Cotton Finishing	H-2 30
Electrical Engineering	B-20 60	Power Weaving	D-10 60
Machine Shop Practice	B-15 60	Business Administration	E-8 45
Cotton Yarn Manufacture	F-1 75		

SECOND TERM

Mill Engineering	B-17 75	Cotton Yarn Manufacture	F-1 45
Engineering Laboratory	B-14 30	Cotton Finishing	H-2 60
Electrical Engineering	B-20 60	Business Administration	E-8 45
Machine Shop Practice	B-15 60	Thesis	120

COURSE I-4—TEXTILE ENGINEERING

Wool Option

(For First Year see page 97)

SECOND YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Textile Chemistry and Dye- ing	C-9 30	Pattern Shop	B-16 45
Physics	B-11 30	Woolen and Worsted Yarn Manufacture	G-1 60
Mathematics	B-2 60	Woolen and Worsted De- sign	D-3 45
Applied Mechanics	B-4 30	Advanced German or French	E-3, 5 45
Machine Drawing	B-8 45	Industrial History	E-6 30
Mechanical Laboratory	B-6 30		
Weaving Mechanism	B-5 30		

SECOND TERM

Textile Chemistry and Dye- ing	C-9 30	Woolen and Worsted Yarn Manufacture	G-1 60
Physics	B-11 30	Woolen and Worsted Design	D-3 45
Mathematics	B-2 60	Power Weaving	D-9 30
Applied Mechanics	B-4 30	Advanced German or French	E-3, 5 45
Machine Drawing	B-8 45	Industrial History	E-6 30
Mechanical Laboratory	B-6 30		
Pattern Shop	B-16 45		

THIRD YEAR

FIRST TERM

Steam Engineering	B-12 60	Woolen and Worsted Yarn Manufacture	G-1 105
Electrical Engineering	B-20 30	Woolen and Worsted De- sign	D-6, 7 45
Machine Drawing	B-10 45	Power Weaving	D-9 45
Physical Laboratory	B-19 30	Economics	E-7 30
Machine Shop Practice	B-15 60		

SECOND TERM

Hydraulics	B-13 30	Woolen and Worsted Yarn Manufacture	G-1 150
Electrical Engineering	B-20 30	Woolen and Worsted De- sign	D-6, 7 45
Machine Drawing	B-10 45	Power Weaving	D-9 45
Power Plants	B-18 30	Economics	E-7 30
Machine Shop Practice	B-15 60		

FOURTH YEAR

FIRST TERM

Mill Engineering	B-17 75	Woolen and Worsted De- sign	D-6, 7 45
Engineering Laboratory	B-14 30	Woolen and Worsted Finishing	H-1 30
Electrical Engineering	B-20 60	Power Weaving	D-10 60
Machine Shop Practice	B-15 60	Business Administration	E-8 45
Woolen and Worsted Yarn Manufacture	G-1 75		

SECOND TERM

Mill Engineering	B-17 75	Woolen and Worsted Finishing	H-1 60
Engineering Laboratory	B-14 30	Business Administration	E-8 45
Electrical Engineering	B-20 60	Thesis	120
Machine Shop Practice	B-15 60		
Woolen and Worsted Yarn Manufacture	G-1 45		

COURSE II-4.—CHEMISTRY AND TEXTILE COLORING

The Four Year Course in Chemistry and Textile Coloring leading to the degree of B. T. D. is especially intended for those who wish to engage in any branch of Textile Chemistry, Textile Coloring, Bleaching, Finishing, or the manufacture and sale of the dyestuffs or chemicals used in the textile industry. The theory and practice of all branches of dyeing, printing, bleaching, scouring, and finishing are taught by lecture work supplemented with a large amount of experimental laboratory work and actual practice in the dye-house and finishing room.

The underlying theories and principles of chemistry are the same no matter to what industry the application is eventually made. Furthermore, no industry involves more advanced and varied applications of the science of chemistry than those of the manufacture and application of the coal-tar coloring matters. In addition, the Textile Colorist must consider the complex composition of the textile fibres, and the obscure reactions which take place between them and the other materials of the textile industry.

During the first year General Chemistry including both Inorganic and Organic is taught by lectures and laboratory work, and this is supplemented during the second term by Qualitative Analysis and Stoichiometry.

Advanced Inorganic Chemistry as well as Advanced Organic Chemistry are studied throughout the second year as a continuation of the Elementary Chemistry of the first year, and much time is spent upon Quantitative Analysis, Industrial Chemistry, and Textile Chemistry and Dyeing.

The foundation work in General Chemistry is continued during the third year with courses in Physical Chemistry, Organic laboratory work, and analytical work. The subject of Industrial Chemistry is introduced and much time is devoted to Advanced Textile Chemistry, Dye Testing, Color Matching, Calico Printing, and Woolen, Worsted, and Cotton Finishing.

The fourth year is characterized by an endeavor to present certain subjects of a more applied nature in such a manner that the student's reasoning power and ability to apply the knowledge gained during the first three years may be developed to the fullest extent. The subject of Engineering Chemistry is introduced and the work in the Dyeing and Analytical laboratories is applied as far as possible to the actual requirements of the factory chemist and colorist. The student is given a thorough course in Microscopy, Photomicrography and the use of the various instruments such as the Spectroscope, Ultra-microscope, Polariscope, Tintometer, etc., which often prove of vital importance in the advanced study of Textile Chemistry. During this fourth year, the student must devote much time to research work, or the original investigation of some assigned subject, upon which he must present a satisfactory thesis, or report, before receiving his degree.

For detailed description of the subjects see pages 115-150.

COURSE II-4—CHEMISTRY AND TEXTILE COLORING

(For First Year see page 97)

SECOND YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Advanced Inorganic Chemistry	C-4 45	Steam Engineering	B-12 30
Textile Chemistry and Dyeing	C-9 82	Physics	B-11 30
Quantitative Analysis	C-6 150	Industrial History	E-6 30
Industrial Laboratory	C-12 97	Advanced German or French	E-3, 5 45

SECOND TERM

Advanced Inorganic Chemistry	C-4 30	Quantitative Analysis	C-6 150
Advanced Organic Chemistry	C-5 30	Industrial Laboratory	C-12 67
Textile Chemistry and Dyeing	C-9, 10 127	Physics	B-11 45
		Industrial History	E-6 30
		Advanced German or French	E-3, 5 45

THIRD YEAR

FIRST TERM

Advanced Textile Chemistry and Dyeing	C-14 210	Physical Chemistry	C-8 30
Industrial Chemistry	C-13 30	Woolen and Worsted Finishing	H-1 30
Quantitative Analysis	C-7 150	Technical German	C-21 30
Advanced Organic Chemistry	C-5 30		

SECOND TERM

Advanced Textile Chemistry and Dyeing	C-14 150	Organic Chemistry Laboratory	C-15 105
Industrial Chemistry	C-13 30	Woolen and Worsted Finishing	H-1 60
Quantitative Analysis	C-7 120	Technical German	C-21 30
Physical Chemistry	C-8 15		

FOURTH YEAR

FIRST TERM

Quantitative and Industrial Analysis	C-7, 17 90	Advanced Organic Chemistry	C-5 120
Advanced Textile Chemistry and Dyeing	C-14 90	Technical German	C-21 30
Engineering Chemistry	C-16 15	Advanced Organic Chemistry (Dyestuffs)	C-20 15
		Thesis	C-19 150

SECOND TERM

Quantitative and Industrial Analysis	C-7, 17 75	Microscopy and Photomicrography	C-18 75
Advanced Organic Chemistry	C-5 120	Thesis	C-19 225

COURSE 1-3.—COTTON MANUFACTURING

The Cotton Manufacturing Course is designed for students contemplating a career in the manufacturing of cotton yarns and cloths or allied industries and who wish to devote but three years to the school work.

During the first year, the studies are common to all courses and include instruction in mechanism, mathematics, mechanical drawing and elementary chemistry. Laboratory work supplements the lectures in chemistry and hand loom weaving assists in illustrating the principles of textile design.

The work in the Cotton Yarn Department comprises instruction in all the processes from the bale to the finished yarn. The instruction consists of lectures upon the machines and processes, and laboratory work upon the machines themselves. In the laboratory each student is required to make exhaustive tests upon each machine and all the settings and adjustments possible. The third year's work in this department is largely devoted to lectures upon the manufacture of specialties, waste products, etc., and special laboratory work, special tests upon yarns and fabrics, mill planning with regard to the arrangement of machinery and other work of an advanced nature.

The course in chemistry consists of lecture and laboratory work on inorganic and organic chemistry followed by instruction in textile chemistry and dyeing, including a short course in the dyeing laboratory.

The work in mechanism is followed by steam engineering, electricity, hydraulics and mill engineering. The mechanical drawing taken in connection with these subjects augments this instruction as well as provides opportunity for students to become skilled in draughting.

The course in textile designing, cloth analysis, and cloth construction includes lectures on plain and fancy weaves and Jacquard work, the analysis of all commercial fabrics, and designs for the same. During the third year of this course students in this department specialize on cotton fabrics.

Power weaving is taken up during the second and third years. Commencing with lectures and practice upon plain looms, the student is taken through dobby and box-loom weaving to Jacquards.

A course in knitting taken during the third year includes the manufacture of hosiery and underwear. There is also a course of lectures on the finishing of cotton fabrics.

For detailed description of the subjects see pages 115-150.

COURSE I-3.—COTTON MANUFACTURING

(For First Year see page 97)

SECOND YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Cotton Yarn Manufacture	F-1 248	*Steam Engineering	B-12 30
Textile Design	D-2 60	Weaving Mechanism	B-5 30
Power Weaving	D-9 30	*Applied Mechanics	B-4 30
Textile Chemistry and Dye- ing	C-9 30	*Physics	B-11 30
*Machine Drawing	B-9 37	Industrial History	E-6 15

SECOND TERM

Cotton Yarn Manufacture	F-1 180	*Machine Drawing	B-9 30
Textile Design	D-2 60	*Hydraulics	B-13 15
Power Weaving	D-9 68	*Applied Mechanics	B-4 30
Textile Chemistry and Dye- ing	C-9, 11 82	*Physics	B-11 30
		Industrial History	E-6 15

THIRD YEAR

FIRST TERM

Cotton Yarn Manufacture	F-1 180	Power Weaving	D-10 195
Knitting	F-2 30	Cotton Finishing	H-2 30
Textile Design, Cloth Con- struction	D-6, 7 30	*Electricity	B-20 30

SECOND TERM

Cotton Yarn Manufacture	F-1 210	Power Weaving	D-10 135
Knitting	F-2 30	Cotton Finishing	H-2 60
Textile Design, Cloth Con- struction	D-6, 7 45	Thesis	

*Subjects are elective for students entering in September, 1912 and thereafter. At least two electives must be taken during each term of the second year.

COURSE II-3.—WOOL MANUFACTURING

The course of Wool Manufacturing is arranged for those who contemplate a career in the manufacture of woolen or worsted fabrics and can devote but three years to the school work. It includes instruction in all of the varied processes employed in adapting the wool fibre to cloth, namely,—sorting, scouring, carding, combing, spinning, designing, weaving, dyeing and finishing. The work is carried on by lectures, recitations and practical work in the laboratories.

Following the first year, which is common to all courses, the student in his second year commences work in the Woolen and Worsted Laboratory, and through systematic steps becomes acquainted with the machines employed in the first steps of yarn manufacturing. At the same time lectures are given upon the many kinds of wool, variation in quality, grades, uses, etc., as influenced by the locality where grown. This is followed by practical work on the sorting table.

The second and third years cover spinning of woolen yarn and worsted yarn by the Bradford and French systems, also the manufacture of tops, including combing, gilling and back washing. Scouring and carbonizing are taken up in detail by lectures and by practical work.

The general chemistry of the first year is followed by textile chemistry and dyeing in the second year. This includes a short course in the Dyeing Laboratory.

Textile design, cloth analysis and construction are continued from the first year throughout the course, the work being applied especially to woolen and worsted goods. Weaving on power looms commences in the second year and continues through the third.

Lectures on finishing commence with the third year and are augmented by extensive practice with the machines in the Finishing Department.

Work in the Engineering Department extends throughout all three years and includes mechanical drawing, properties of saturated steam, electricity and hydraulics. The practical application of the principles studied in these subjects is brought out forcibly in the work on mill engineering, where mill design and construction are considered. A short course covering methods employed in the testing of fibres, yarns and cloths, together with laboratory work in the manipulation of certain physical apparatus, is given in the third year.

For detailed description of the subjects see pages 115-150.

COURSE II-3.—WOOL MANUFACTURING

(For First Year see page 97)

SECOND YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Woolen and Worsted Yarn		*Machine Drawing	B-9 30
Manufacture	G-1 248	*Steam Engineering	B-12 30
Textile Design	D-3 60	Weaving Mechanism	B-5 30
Power Weaving	D-9 30	*Applied Mechanics	B-4 30
Textile Chemistry and Dye- ing	C-9 30	*Physics	B-11 30
		Industrial History	E-6 15

SECOND TERM

Woolen and Worsted Yarn		*Machine Drawing	B-9 30
Manufacture	G-1 180	*Hydraulics	B-13 15
Textile Design	D-3 60	*Applied Mechanics	B-4 30
Power Weaving	D-9 68	*Physics	B-11 45
Textile Chemistry and Dye- ing	C-9, 11 82	Industrial History	E-6 15

THIRD YEAR

FIRST TERM

Woolen and Worsted Yarn		Power Weaving	D-10 202
Manufacture	G-1 128	Woolen and Worsted	
Knitting	F-2 30	Finishing	H-1 75
Textile Design, Cloth Con- struction	D-6,7 30	*Electricity	B-20 30

SECOND TERM

Woolen and Worsted Yarn		Power Weaving	D-10 120
Manufacture	G-1 180	Woolen and Worsted	
Knitting	F-2 30	Finishing	H-1 75
Textile Design, Cloth Con- struction	D-6,7 45	Thesis	

*Subjects are elective for students entering in September, 1912 and thereafter. At least two electives must be taken during each term of the second year.

COURSE III-3.—TEXTILE DESIGN

(General Textile Course)

The general course in Textile Design is planned to meet the demand of young men for a technical training in the general processes of textile manufacturing, but with particular reference to the design and construction of fabrics. To this end a foundation is laid in the first year by instruction in mechanics, mechanical drawing, mathematics, chemistry and the elementary principles of designing and weaving. The student is required to pursue a course in the yarn departments, both cotton and wool. By this method he acquires a knowledge of the manufacture of cotton yarns from the bale to the yarn and of woolen and worsted yarns from the fleece through the varied processes of manufacturing woolen yarn or worsted yarn by both the French and Bradford Systems.

Throughout his entire course he receives instruction in design, cloth analysis and construction of all the standard cloths, viz.—trouserings, coatings, suitings, blankets, velvets, corduroys, plushes, etc. This leads into advanced work in Jacquard designing, and is supplemented by work in decorative art.

The course in general inorganic and organic chemistry of the first year leads to the subjects of textile chemistry and dyeing in the second year. The instruction includes a short course in the dyeing laboratory.

Power weaving commences with the second year and continues throughout the course.

During the third year the student receives instruction in the finishing of woolen and worsted cloths. This instruction is given by means of lecture and laboratory work.

The instruction in the Engineering Department is carried along parallel with the other subjects of the course and includes steam, electricity and hydraulics. In the third year mill engineering is taken up and serves to show the application of the principles studied in the previous years. Mechanical drawing extends throughout all three years and finds extensive application in the machine departments.

For detailed description of the subjects see pages 115-150.

COURSE III-3.—TEXTILE DESIGN

General Textile Course

(For First Year see page 97)

SECOND YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Textile Design, Decorative Art, Hand Loom Weaving	D-2, 3, 4, 5 188	*Machine Drawing	B-9 37
Cotton Yarn Manufacture	F-1 60	*Steam Engineering	B-12 30
Power Weaving	D-9 60	Weaving Mechanism	B-5 30
Textile Chemistry and Dyeing	C-9 30	*Applied Mechanics	B-4 30
		*Physics	B-11 30
		Industrial History	E-6 15

SECOND TERM

Textile Design, Decorative Art, Hand Loom Weaving	D-2, 3, 4, 5 187	Textile Chemistry and Dyeing	C-9, 11 52
Cotton Yarn Manufacture	F-1 90	*Hydraulics	B-13 15
Power Weaving	D-9 67	*Applied Mechanics	B-4 30
		*Physics	B-11 30
		Industrial History	E-6 15

THIRD YEAR

FIRST TERM

Textile Design, Cloth Construction, Decorative Art	D-6, 7, 8 158	Power Weaving	D-10 120
Woolen and Worsted Yarn Manufacture	G-1 112	Woolen and Worsted Finishing	H-1 75
		*Electricity	B-20 30

SECOND TERM

Textile Design, Cloth Construction, Decorative Art	D-6, 7, 8 195	Power Weaving	D-10 127
Woolen and Worsted Yarn Manufacture	G-1 112	Woolen and Worsted Finishing	H-1 75
		Thesis	

*Subjects are elective for students entering in September, 1912 and thereafter. At least two electives must be taken during each term of the second year.

COURSE IV-3.—CHEMISTRY AND DYEING

The regular course in Chemistry and Dyeing is especially recommended to those who intend to enter upon any branch of textile coloring, bleaching, or the manufacture or sale of the various dyestuffs and chemicals used in the textile industry. The theory and practice of all branches of dyeing, printing, bleaching, scouring, etc., are taught by lecture work supplemented with a large amount of laboratory work.

During the first year general chemistry, including both inorganic and organic, is taught by lectures and laboratory work, and this is supplemented during the second term by qualitative analysis and stoichiometry.

Advanced inorganic as well as advanced organic chemistry are studied throughout the second year as a continuation of the elementary chemistry of the first year, but the greater part of the time is spent upon quantitative analysis, industrial chemistry and textile chemistry and dyeing.

The third year is devoted to advanced textile chemistry and dyeing, dye testing, dye matching, woolen and worsted finishing, calico printing and cotton finishing, quantitative analysis, industrial chemistry, physical chemistry and thesis work.

The work is taken up in a thorough manner and has been so arranged that an equal amount of time is spent in the laboratories and in classroom work. Sufficient studies are taken in the other departments to broaden the knowledge of the student in regard to textile work in general, and he is given such training as the time will permit in mathematics, mechanical drawing, modern languages and designing.

The student who conscientiously performs all of the prescribed laboratory work and the practice work should be proficient not only in dyeing and textile printing, but should be well trained in the methods of analysis and the testing of the various chemicals, mordants and dyestuffs so extensively used in the textile industry.

For detailed description of the subjects see pages 115-150.

COURSE IV-3.—CHEMISTRY AND DYEING

(For First Year see page 97)

SECOND YEAR

FIRST TERM

		Hours of Exercise			Hours of Exercise
Advanced Inorganic Chemistry	C-4	45	Industrial Laboratory	C-12	75
Advanced Organic Chemistry	C-5	30	Steam Engineering	B-12	30
Quantitative Analysis	C-6	150	Physics	B-11	30
Textile Chemistry and Dyeing	C-9, 10	112	Power Weaving	D-9	22
			Industrial History	E-6	15

SECOND TERM

Advanced Inorganic Chemistry	C-4	30	Textile Chemistry and Dyeing	C-9, 10	247
Advanced Organic Chemistry	C-5	30	Physics	B-11	45
Quantitative Analysis	C-6	128	Industrial History	E-6	15

THIRD YEAR

FIRST TERM

Quantitative Analysis	C-7	165	Advanced Textile Chemistry and Dyeing	C-14	255
Physical Chemistry	C-8	30	Woolen and Worsted Finishing	H-1	30
Industrial Chemistry	C-13	30			

SECOND TERM

Quantitative Analysis	C-7	127	Engineering Chemistry	C-16	15
Physical Chemistry	C-8	15	Industrial Analysis	C-17	37
Industrial Chemistry	C-13	30	Woolen and Worsted Finishing	H-1	68
Advanced Textile Chemistry and Dyeing	C-14	105	Thesis	C-19	113

COURSE VI-3.—TEXTILE ENGINEERING

The course in Textile Engineering is planned to train the student to meet intelligently the engineering problems of the textile industry, as well as to provide him with the essentials of the processes and machines in the varied branches of this industry.

The student is first thoroughly grounded in the broad fundamental principles of science and mathematics underlying all engineering work and textile manufacturing with its many closely allied industries. The most important of the preliminary subjects are mathematics, physics, mechanics and mechanism, and mechanical drawing. The work in mechanism and drawing is particularly thorough and the practical uses of these subjects are considered of first importance. The study of physics while taking up the usual branches included in this subject is arranged with special reference to problems involved in the physical testing of fibres, yarns and fabrics. The student is required to spend a portion of his time during the course upon the subjects of cotton yarns, woolen and worsted yarns, and power weaving with practical work in each branch. During his first year he has a brief course in the elements of design, and in his second year he pursues a course in textile chemistry and dyeing which is preceded in the first year by the necessary preliminary course in elementary organic and inorganic chemistry. Special importance is attached to the study of power generation, transmission, and measurement and courses with laboratory practice are given in the elements of steam, electrical and hydraulic engineering, to familiarize the student with the means, methods and results available in the modern practice of these branches.

The recently equipped engineering laboratory together with the extensive power plant of the school affords opportunities for a varied line of experimental work including boiler, engine, turbine, generator and pump tests. Systematic instruction in the most approved methods of machine shop practice is provided in the shop which is fully equipped with the best makes of modern tools. This feature of the course is considered a most valuable adjunct to the training of a textile engineer.

The work in mill engineering covers a wide range of subjects including mill construction with calculations and drawings, mill heating, lighting, fire protection, and electric driving. The arrangement of plants and machinery for the most economical power distribution and efficient organization is also taken up in detail, data for problems being taken from actual cases and the solutions compared with those of some of our best known mill engineers.

For detailed description of the subjects see pages 115-150.

COURSE VI-3.—TEXTILE ENGINEERING

(For First Year see page 97)

SECOND YEAR

FIRST TERM

		Hours of Exercise		Hours of Exercise
Cotton Yarn Manufacture	F-1	60	Weaving Mechanism	B-5 30
Power Weaving	D-9	30	Applied Mechanics	B-4 30
Textile Chemistry and Dye- ing	C-9	30	Machine Shop Practice	B-15 75
Mathematics	B-2	45	Mechanical Laboratory	B-6 38
Machine Drawing	B-8	75	Physics	B-11 30
Steam Engineering	B-12	30	Industrial History	E-6 15

SECOND TERM

Cotton Yarn Manufacture	F-1	90	Hydraulics	B-13 15
Power Weaving	D-9	38	Applied Mechanics	B-4 30
Textile Chemistry and Dye- ing	C-9	15	Machine Shop Practice	B-15 60
Mathematics	B-2	45	Mechanical Laboratory	B-6 75
Machine Drawing	B-8	45	Physics	B-11 30
			Industrial History	E-6 15

THIRD YEAR

FIRST TERM

Woolen and Worsted Yarn Manufacture	G-1	112	Cotton Finishing	H-2 30
Power Weaving	D-10	38	Machine Shop Practice	B-15 60
Woolen and Worsted Finishing	H-1	30	Engineering Laboratory	B-14 37
			Machine Drawing	B-10 75
			Electricity	B-20 30

SECOND TERM

Woolen and Worsted Yarn Manufacture	G-1	112	Machine Shop Practice	B-15 60
Woolen and Worsted Finishing	H-1	67	Engineering Laboratory	B-14 45
Cotton Finishing	H-2	30	Machine Drawing	B-10 75
			Power Plants	B-18 15
			Thesis	

ENTRANCE REQUIREMENTS

The requirements for admission to this school are given in detail on pages 67-79.

DIPLOMA COURSES—REQUIRED SUBJECTS

- A-1 Plane Geometry
- A-2 Algebra (I Elementary. II Advanced.)
- A-3 Elementary German B
or
- A-4 Elementary French B
- A-5 English
- A-6 American History
- A-7 Arithmetic

DEGREE COURSES—REQUIRED SUBJECTS

- A-1 Plane Geometry
- A-2 Algebra (I Elementary. II Advanced.)
- A-3 Elementary German A
or
- A-4 Elementary French A
- A-5 English
- A-6 American History

DEGREE COURSES—ELECTIVE SUBJECTS

- A-8 Physics
- A-9 Chemistry
- A-10 Solid Geometry
- A-11 Trigonometry
- A-12 Mechanical Drawing
- A-13 Mechanic Arts
- A-14 English History
- A-15 Advanced German
or
- A-16 Advanced French
- A-17 English

Subjects of Instruction

TEXTILE ENGINEERING DEPARTMENT—B

Mathematics

(Algebra, Trigonometry, Elements of Analytical Geometry)—B-1

PREPARATION: A-1, A-2

This subject is given in the first year with the view of consolidating the separate branches of mathematics that have been given in previous years. The progress of the school has been such as to necessitate the introduction of Higher Algebra and Trigonometry, in the early part of the first term, and hence, as in other technical schools, it has resulted in a combined course. This course is presented by means of lectures, text-book, class and problem work, and consists essentially of the following: Progressions, Graphical Representation, Permutations and Combinations, Logarithms, Slide Rule, Trigonometry, Binomial Theorem, Partial and Continued Fractions, Series, Theory of Equations, Significant Figures, and Plotting of Scientific Data, Straight Line Equation, Point of Division of a Line, Equation of Parallel and Perpendicular Lines.

[ALL COURSES]

Mathematics

(Analytical Geometry, Differential Calculus, Elements of Integral Calculus)—B-2

PREPARATION: B-1

This course is a continuation of the work of the first year, and treats of the following subjects: Formulae of Differentiation, Conic Sections, Transformation of Co-ordinates, Maxima and Minima, Direction of Curves, Center and Radius of Curvature, Problems on Differential Calculus, Elements of Integral Calculus, Integration as a Summation, and Plane Areas. The above are treated in both Rectangular and Polar Co-ordinates. Formulae of Integration, Intergration by parts, Integration by Substitution, Successive integration, Evaluation of Integrals, Center of Gravity, Center of Pressure, Total Pressure, Moment of Inertia.

[COURSES I-4, VI-3]

Mechanics and Mechanism—B-3

PREPARATION: A-1, A-2, B-1. TAKEN SIMULTANEOUSLY WITH B-1

These subjects are a necessary preparation for all courses and are taken in one hundred and twenty hours of lectures and recitations covering the whole of the first year. The fundamental principles of these subjects are considered of the greatest importance and the applications and problems are selected with special reference to their practical uses in textile machinery. The large variety of mechanism applications met in textile machines makes this course an essential one as a proper preparation for the student's later work in spinning and weaving. Some of the subjects treated in this course are:

MECHANICS

Work, power and energy.
Principle of moments.
Simple and compound levers.
Differential and common pulleys.
Jack screw and worm and wheel.
Parallelogram and triangle of forces.
Inclined plane and wedge.

MECHANISM

Linear and angular velocity.
Belting calculations.
Gears and gear trains.
Cam and cone pulley design.
Linkage problems.
Intermittent motions.
Differential and epicyclic trains.

[ALL COURSES]

Applied Mechanics—B-4

PREPARATION: B-1 AND B-3

The work in this course is presented by lectures and recitations. First are considered mathematical and graphical conditions for equilibrium for any system of forces and the subjects of center of gravity and funicular polygons are introduced. Then follow problems on bridge and roof trusses under various conditions of dead, live, wind and snow loading. Masonry arches are finally considered. The course also includes a study of moment of inertia, dynamics and strength of materials.

[COURSES I-4, VI-3]

Weaving Mechanism—B-5

PREPARATION: TAKEN SIMULTANEOUSLY WITH D-9

This course consists of thirty lectures given during the first term of the second year and is required by all the regular students taking power weaving. A thorough analysis of all the important motions of power weaving is undertaken and the treatment is by graphical and analytical methods. The object of this course is to so familiarize the student with the theory of the mechanism of the loom that the time spent in the weave room on loom fixing will be used to the best advantage.

[COURSES I-4, I-3, II-3, III-3 AND VI-3]

Mechanical Laboratory—B-6

PREPARATION: B-3. TAKEN SIMULTANEOUSLY WITH B-4

This work is given during the second year and is supplementary to the course in Mechanism and Applied Mechanics. Especial importance is attached to the demonstration of the fundamental principles of these subjects. Some of the experiments and tests made in this course are as follows:

Determination of coefficient of friction.

Proof of principle of moments.

Proof of principle of work.

Efficiency test of various hoisting and lifting appliances, such as tackle and fall, worm block, differential and triplex blocks, jack screws, wedges, etc.

Experimental proofs of the principles of graphic statics.

Efficiency tests on belt transmissions including measurement of belt tensions, coefficient of friction, slip, etc.

Tests on various types of absorption dynamometers.

Calibration of transmission dynamometer.

Power measurements on textile machinery with differential dynamometer.

Measurement of friction of steam engine.

[COURSES I-4, VI-3]

Mechanical Drawing—B-7

PREPARATION: A-I. TAKEN SIMULTANEOUSLY WITH B-3

This course is taken during the first year, and consists of work in the drawing room supplemented by lectures. This subject is considered of the greatest importance as a preparation for the student's future work and the practical usefulness of drawing of this character is fully emphasized. The course is systematically laid out covering in order the following divisions:

Care and use of drawing instruments.

Geometrical constructions.

Elements of projections and descriptive geometry.

Isometric projection.

Developments with practical applications.

Sketching practice on machine details.

[ALL COURSES]

Machine Drawing—B-8

PREPARATION: B-7

This work is the continuation of the mechanical drawing and is pursued throughout the entire second year. This work is wholly of a practical character and includes sketching from textile machinery details, working scale detail and assembly drawing, tracing and blue printing. The rudiments of machine design to supplement the work in strength of materials is also given.

[COURSES I-4, VI-3]

Machine Drawing—B-9

PREPARATION: B-7

For students electing machine drawing in the second year of any of the three year manufacturing courses, the instruction given is similar to that of B-8, exclusive of the work on machine design.

[COURSES I-3, II-3, III-3]

Machine Drawing—B-10

PREPARATION: B-3, B-7, B-8

During the third year a period of five hours per week is devoted to advanced graphical mechanism problems. The data for all of these problems is in every case taken directly from some of the textile machines that the students meet in other departments. These problems include cam designs for builder motions, mule scroll layouts, Scaife builder motion analysis, fly frame cone design, mule quadrant motion, analysis of camless winder and a number of others of similar character.

[COURSE I-4]

Physics—B-11

PREPARATION: B-I

This course is given during the second year and serves especially as a preparation for Steam Engineering, Hydraulics, Electricity and the Study of Color. The subject is presented by means of lectures, recitations, problems, and reference books. The lectures deal chiefly with the application of the various physical laws and principles with the view of their adaption to the above subjects, while the reference books are used to supplement the lectures. The subjects taken up are essentially as follows: Gravitation, Moving Bodies, Mechanics, Elasticity, Hydrostatics, Elements of Hydraulics, Properties of Fluids and Gases, and the Theory of Sound. These subjects are followed by a series of lectures on heat phenomena dealing with the Generation of Heat, Thermometry, Calorimetry, Transfer of Heat, its Effect on Solids, Liquids, and Gases, and problems such as lead up to the Elements of Steam Engineering.

The latter part of the course is devoted to the discussion of the laws governing the Nature, Propagation and Transmission of Light waves, special stress being laid on interference, reflection and refraction, mirrors, lenses, microscope, spectroscope and photometer. Particular attention is given to the color effects produced by the combination of different colors in connection with Maxwell's Color Diagram and the Young Helmholtz Theory of Color Sensation. During the last part of the course the principles of Electricity and Magnetism are taken up in detail.

[COURSES I-4, II-4, IV-3, VI-3]

Steam Engineering—B-12

PREPARATION: B-II

The purpose of this work is to familiarize the student with the essentials of power generation and the means and methods of modern practice in steam engineering.

The different types of boilers, engines, pumps, condensers, turbines, and other important features of a steam plant are first considered with reference to their construction and general arrangement. The remainder of the course is devoted to a thorough study of these elements of a power

plant from the standpoint of the heat phenomena upon which their operation and efficient performance depend. Practice with the steam engine indicator is included in this work, and also engine and boiler testing.

[COURSES I-4, II-4, IV-3, VI-3]

Hydraulics—B-13

PREPARATION: B-3, B-11

This subject is presented by means of lectures covering the principles of hydraulics, including hydrostatics, measurements of flow of water through orifices, pipes, nozzles and over weirs. The different types of turbines are studied with results of tests and rating tables.

[COURSES I-4, VI-3]

Engineering Laboratory—B-14

PREPARATION: B-12

The principles underlying the subjects of Steam Engineering, Hydraulics and Thermodynamics are demonstrated in a practical manner in the work in the Engineering Laboratory. Greater importance is attached to the development of initiative and responsibility in the student than the mere accomplishment of a large number of carefully planned tests. The character of this work is indicated by the following list of experiments and tests:

Calibration of gages, thermometers, indicators, anemometers, tachometers, and other measuring instruments.

Experiments on flow of steam.

Calorimeter tests.

Radiation tests and pipe covering tests.

Injector and ejector tests.

Engine tests. Condensing and non-condensing.

Steam pump tests.

Surface condenser tests.

Valve setting.

Boiler testing.

Tests on heating and ventilating fans, both motor and engine driven.

Pump tests. Triplex and centrifugal.

Air compressor tests.

Flue gas analysis.

Steam turbine tests. Condensing, non-condensing and low pressure.

Complete steam plant testing.

Gas engine testing.

[COURSES I-4, VI-3]

Machine Shop Practice—B-15

PREPARATION: B-3

Systematic instruction is given in the most approved methods of machine shop practice, the object being to familiarize the student with the proper use of hand and machine tools and the characteristics of the different materials worked. Arrangements have been made with a local machine company of such a character as to give the work the greatest educational value and the important commercial element which stimulates the student's interest. Particular attention is given to the form, setting, grinding and tempering of tools and the mechanism of the different machines involving certain speeds, feeds, etc. The course is so planned that the instruction in each typical operation shall conform as nearly as possible to commercial machine shop practice on textile machinery. The list of tools which appears under Equipment in this bulletin gives an idea of the scope of the work which includes chipping and filing, tool grinding and tempering, straight and taper turning, screw cutting, drilling and boring, planer work; milling machine work, including gear cutting. Instruction is also given in the use of wood working tools, both hand and machine and in forging.

[COURSES I-4, VI-3]

Pattern Shop—B-16

To familiarize the student with the care and use of wood working tools a course in carpentry and pattern making is given in the second year. It consists of three hours shop-work per week, throughout the year. The exercises include briefly framing, splicing, mortising and wood turning. Principles of moulding are explained and patterns for ordinary standard machine parts are made.

[COURSE I-4]

Mill Engineering—B-17

PREPARATION: B-3, B-4, B-10

This work covers a wide range of subjects and is of the most practical character possible. All of the student's previous work in engineering and his knowledge of the textile processes are here brought together in the consideration of the larger problems of mill design, construction and organization. A detailed study is made of the most modern types of mill buildings including all calculations and drawings. Practice is also given with the engineer's transit and level in plane surveying, setting batters, lining and leveling shafting.

The modern methods of power transmission and the proper arrangement of textile machinery are also given careful consideration. The problems are in every case taken from actual conditions from mills already built or in process of construction. The questions of mill heating,

ventilation, lighting, humidification and fire protection are also studied and the time spent in the drawing-room enables the student to work out nearly all of the more important problems involved in the design of an entire textile mill plant. The close relation existing between proper plant design and economical production is also considered.

[COURSES I-4]

Power Plants—B-18

PREPARATION: B-13

This course, which consists of lectures given in the second term of the third year, takes up the fundamental considerations involved in the planning of a power plant for a textile mill. A standard text book is used in connection with the lectures and the problems are taken largely from plans of existing modern plants. The choice of type and size of units for certain conditions are given particular attention.

[COURSES I-4, VI-3]

Physical Laboratory—B-19

PREPARATION: B-11

Laboratory work is given during the third year to familiarize the student with physical measurements and to exemplify the principles set forth in the lectures in Physics. Reports are prepared from each experiment giving the object of the experiment, method of procedure observations and conclusions, in order that the student may acquire practice and understand the interpretation of data. Particular attention is given to physical tests upon textile material.

[COURSE I-4]

Electrical Engineering—B-20

PREPARATION: B-11

The elementary principles of Electricity and Magnetism are considered in a lecture course. The development and application are shown by detailed study of the means used to generate, transmit, and transform electrical energy to meet the requirements of textile machinery and plants. This involves the theory of Direct and Alternating Generators, Motors, Instruments, as well as the various phenomena associated with them.

The laboratory course includes a study of instruments and methods employed in general electrical power testing. Attention is given to various lighting units, their particular properties and relative values in meeting the special problems of illumination in textile mills.

[COURSES I-4, VI-3]

CHEMISTRY AND DYEING DEPARTMENT—C

Elementary Chemistry (Inorganic and Organic Chemistry)—C-1

Instruction in Elementary Chemistry extends through the first year and includes lectures, recitations, and a large amount of individual laboratory work upon the following subjects:

Inorganic Chemistry

Chemical Philosophy

Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, salts, Avogadro's law, molecular weights, formulas, valence, periodic law, etc.

Non-Metallic Elements

Study of their occurrence, properties, preparation, chemical compounds, etc.

Metallic Elements

Study of their occurrence, properties, metallurgy, chemical compounds, etc.

The students take up as thoroughly as the time will permit the qualitative detection of the more common metals and non-metals, with practical work.

Organic Chemistry

The Hydrocarbons and their Derivatives

Study of their occurrence, properties, preparations and uses. This work although elementary in character is of sufficient breadth to prepare the student understandingly for the work with the artificial dyestuffs which follows.

[ALL COURSES]

Qualitative Analysis—C-2

PREPARATION: C-1 TAKEN SIMULTANEOUSLY

Qualitative Analysis is studied during the second term of the first year. The work is based upon Prescott and Johnson's Qualitative Chemical Analysis and consists of lectures, recitations, and laboratory work. The student must become familiar with the separations and the detections of the common metals and acids by the analysis of a satisfactory number of solutions, salts, alloys, and pigments. At intervals during the term, short laboratory tests are given as well as the regular written examinations.

No pains are spared to make the course as valuable to the student as possible and to encourage only thorough and intelligent work.

When sufficiently advanced, students take up the examination of various products with which the textile chemist must be familiar, such as testing mordanted cloths, pigments, and the various dyeing reagents.

During the latter part of this course a certain amount of time is devoted to the preliminary operations of Quantitative Analysis, such as the precipitation and washing of such substances as barium sulphate, magnesium ammonium phosphate and calcium oxalate, although no weighings or actual determinations are made.

A student's marks in this subject depend as much upon the neatness and care used in manipulation as upon the actual results obtained.

[COURSES II-4, IV-3]

Stoichiometry—C-3

PREPARATION: B-I

This subject is taken during the second half of the first year. The application of the metric system is thoroughly studied, and problems are worked involving the expansion and contraction of gases, determination of empirical formulae, combining volume of gases and quantitative analysis.

[COURSES II-4, IV-3]

Advanced Inorganic Chemistry—C-4

PREPARATION: C-I

The whole subject of Inorganic Chemistry is reviewed during the second year, and many advanced topics are introduced which were necessarily omitted from the first year course in General Chemistry.

[COURSES II-4, IV-3]

Advanced Organic Chemistry—C-5

PREPARATION: C-I

In this course which consists of lectures and recitations, the principles of organic substitution and synthesis are thoroughly discussed, and as many illustrations are used as the time will permit, particularly such as are applied in the arts. The alliphatic series of hydrocarbons and their derivatives are studied for about twenty weeks, the remainder of the time being devoted to the benzene series. The aim of the course is to lay a broad foundation for the study of the Chemistry of the artificial dyestuffs. Students are required to work out problems in the synthesis of various compounds in order to become familiarized with equation writing.

[COURSES II-4, IV-3]

Quantitative Analysis—C-6

PREPARATION: C-2, C-3

During the second year, the principles of analytical work are thoroughly taught, the work being based on Talbot's Quantitative Chemical Analysis. Gravimetric analysis is studied during the first term, and volu-

metric analysis during the second term. The samples analyzed include salts, ores, minerals, bleaching powder and alkalies. Frequent recitations are held for the discussion of methods and the solution of stoichiometrical problems. Students are encouraged to read the standard works and magazines on chemical subjects, in order to cultivate broad views of the science.

[COURSES II-4, IV-3]

Quantitative Analysis—C-7

PREPARATION: C-6

This course consists chiefly of technical analysis, the principal consideration being the analysis of water, alum, ammonia, soaps, coal, indigo, tannin, and the ultimate analysis of organic compounds, as well as the examination of acids, alkalies, oils, scouring materials and such substances as starches, gums, and other thickeners, and the detection of adulterants.

No pains are spared to give the student the benefits of all the latest researches along the lines of industrial analytical methods, and original work is encouraged in all.

[COURSES II-4, IV-3]

Physical Chemistry—C-8

PREPARATION: C-4, C-5, B-11

This subject is studied during the third year. It includes the principles of calorimetry, specific heat, vapor density, the various methods of determining molecular weights, laws of solutions, electrolytic dissociation, theories of precipitation, thermo-chemistry, surface tension, etc. The student is required to work out a large number of problems introduced by the subject.

[COURSES II-4, IV-3]

Textile Chemistry and Dyeing—C-9

PREPARATION: C-1, B-3, B-7

The outline of the lecture course which is given through the second year is as follows:

Technology of Vegetable Fibres

Cotton, Linen, Jute, Hemps, China Grass. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies and heat.

Technology of Animal Fibres

Wool, Mohair, Silk. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies and heat.

Technology of Artificial Fibres

Study of the various forms of artificial silk, the process of manufacture, their properties and action with chemicals, acids and heat.

Operations Preliminary to Dyeing

Bleaching of cotton and linen, wool scouring, bleaching, fulling and felting of wool, carbonizing, silk scouring and bleaching, action of soap.

The bleaching of cotton cloth, yarn and raw stock is studied at length with detailed descriptions of the various forms of kiers and machinery used; also the action of the chemicals used upon the material and the various precautions that must be taken in order to insure successful work.

Under this heading is also included an exhaustive study of the reagents used in emulsive wool scouring process and their action upon the fibre under various conditions; also the most successful of the solvent methods for degreasing wool.

Water and its Application in the Textile Industry

Impurities present, methods for detection, their effect during the different operations of bleaching, scouring, dyeing and printing, and the methods for their removal or correction.

The important subject of boiler waters is also studied under this heading with a full discussion of the formation of boiler scale, its disastrous results and the methods by which it may be prevented.

Mordants and Other Chemical Compounds used in Textile Coloring not Classified as Dyestuffs

Theory of mordants, their chemical properties and their application, aluminum mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannin materials, soluble oil, fixing agents, levelling agents, assistants, and numerous other compounds, not dyestuffs, that are extensively used in the textile industry.

Under the heading are included the definitions of various terms and classes of compounds used by textile colorists, such as color lakes, pigments, fixing agents, developing agents, mordanting assistants, mordanting principles and levelling agents.

Theory of Dyeing

A discussion of the chemical, mechanical, solution and absorption theories, and the various views that have been advanced by different investigators of the chemistry and physics of textile coloring processes.

Under this heading are discussed the general methods of classifying dyestuffs and definitions of such terms as textile coloring, dyeing textile printing, substantive and adjective dyestuffs, monogenetic and polygenetic dyestuffs.

Natural Organic Coloring Matters

Properties and application of indigo, logwood, catechu or cutch, Brazil wood, cochineal, fustic, tumeric, madder, quercitron bark, Persian berries, and other natural dyestuffs that have been used within recent years by textile colorists.

Mineral Coloring Matters

Under this heading are discussed the properties of such inorganic coloring matters and pigments as chrome yellow, orange and green, Prussian blue, manganese brown, and iron buff.

Artificial Coloring Matters

General discussion of their history, nature, source, methods of manufacture, methods of classification, and their application to all fibres.

Special study of:—

Basic Coloring Matters.

Phthalic Anhydride Colors, including the eosins and phloxines.

Acid Dyestuffs.

Janus Colors.

Direct Cotton Colors.

Sulphur Colors.

Mordant Colors, including the alizarines and other artificial coloring matters requiring metallic mordants.

Mordant Acid Colors.

Insoluble Azo Colors, developed on the fibre.

Reduction Vat Colors, including Artificial Indigo, Indanthrene, Flavanthrene, Viridanthrene and Melanthrene.

Aniline Black and other artificial dyestuffs not coming under the above heads.

As each class of dyestuffs is taken up, the details of the methods of applying them upon all the different classes of fabrics and in all the different forms of dyeing machines are thoroughly discussed; also the difficulties which may arise in their application, and the methods adopted for overcoming them.

Machinery used in Dyeing

A certain amount of time is devoted to the description of the machinery used in the various processes of textile coloring, which is supplemented as far as possible by the use of charts, diagrams, and lantern slides.

Most of the important types of dyeing machines are installed within the dyehouse of the School and the students can be taken directly from the lecture room and shown the machines in actual operation.

[ALL COURSES]

Dyeing Laboratory—C-10

PREPARATION : C-9 TAKEN SIMULTANEOUSLY

Besides lectures and recitations upon the subject of Textile Chemistry and Dyeing practical laboratory work is required. By the performance of careful and systematic experiments the student learns the nature of the various dyestuffs and mordants, their coloring properties, their action under various circumstances and the conditions under which they give the best results. The more representative dyestuffs of each class are applied to cotton, wool and silk, and each student is obliged to enter in an especially arranged sample book, a specimen of each of his dye trials with full particulars as to the conditions of experiment, percentage of compounds used, time, temperature of dye bath, etc.

For convenience and economy most of the dye trials are made upon small skeins or swatches of the required material, but from time to time students are required to dye larger quantities, in the full sized dyeing machines which are described elsewhere.

By the use of a small printing machine the principles of calico printing are illustrated, and by means of the full sized dyeing machines and vats, the practical side of the subject is studied. It is the constant endeavor of those in charge, to impart information of a theoretical and scientific character that will be of value in the operation of a dyehouse.

[COURSES II-4, IV-3]

Dyeing Laboratory—C-11

PREPARATION : C-9. TAKEN SIMULTANEOUSLY

This course in general laboratory work in Textile Chemistry and Dyeing is given during the second term of the second year. It is so arranged as to acquaint the student with the properties of the fibres, mordants and coloring matters, and their application in the Textile Industry.

[COURSE I-3, II-3, III-3]

Industrial Chemistry Laboratory—C-12

PREPARATION : C-I

Special attention has been given to this subject because it is considered extremely important in the study of chemistry in general, and of textile chemistry in particular. During the second year considerable time is spent in the laboratory in the actual manufacture, from raw materials, of the chemical compounds used in textile work. Each student is required to make careful record of all of the crude materials used, as starting points, and to carry the various processes through carefully with the view of producing as great and pure a yield of each substance as possible. Industrial Chemistry not only involves the appli-

cation of the principles of both inorganic and organic chemistry, but of analytical work as well, for the purity of the compounds produced must be tested after their manufacture.

In addition to the general work in this subject, each student is required to make a special study of the manufacture of some chemical from raw materials in considerable quantity (20 to 25 pounds) making a complete quantitative analysis of all the raw materials used and of the finished product, accounting for everything throughout the process with the object of producing as near the theoretical yield as possible. The student is charged with the amount of raw material at market prices, and the finished product is bought back by the school.

Recently much new apparatus has been added to the industrial chemistry laboratory, and it is now believed to be one of the most complete of its kind. The present equipment allows a comparatively large quantity of material to be handled at one time.

[COURSES II-4, IV-3]

Industrial Chemistry

Lecture—C-13

PREPARATION: C-4, C-5, C-12

During the whole of the third year, lectures and recitations are held in Industrial Chemistry, the course in general following "Thorpe's Outline of Industrial Chemistry." Particular attention is paid to those subjects which are of special interest to the textile chemist, as oils, soaps, gas and coal tar industry, building materials, and the manufacture on a large scale of important chemical compounds, such as the common acids and alkalies, bleaching powder, various mordants, etc. The course is illustrated as far as possible with specimens, diagrams and charts, and the students are given an opportunity to visit some of the industrial establishments in the vicinity of Lowell and Boston.

[COURSES II-4, IV-3]

Advanced Textile Chemistry and Dyeing—C-14

PREPARATION: C-9, C-10

This is a continuation of the Textile Chemistry and Dyeing of the second year and includes a review of the second year's work in this subject, with the introduction of many advanced considerations, and in addition the following subjects:—

Classification and Construction of Artificial Dyestuffs

A study from a more advanced standpoint of the classification and constitution of artificial dyestuffs, including the various methods used in their production, also the orientation of the various groups which are characteristic of these compounds, and their effect on the tinctorial power of dyestuffs.

The object of this study is to give the student a more complete knowledge of the artificial dyestuffs from the color manufacturer's point of view, which will prove of particular value to those who intend later to enter the employ of dyestuff manufacturers or dealers.

Color Matching and Color Combining

A study of that portion of physics which deals with color, and the many color phenomena of interest to the textile colorist, the lecture work being supplemented with the practical application of the spectroscope and tintometer, and much practice in the matching of dyed samples of textile material.

The primary colors both of the scientist and textile colorist and the results of combining colored lights and pigments, and such subjects as color perception, color contrast, purity of color, luminosity, hue, color blindness, dichroism, fluorescence, and the effect of different kinds upon dyed fabrics are discussed under this heading.

Each student's eyes are tested for color blindness early in the course in order that he may be given an opportunity to change his course if his eyes should prove defective enough to interfere with his work as a textile colorist.

A dark room has been provided where various experiments in color work and color matching may be performed.

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Dye Testing

This subject includes the testing of several dyestuffs of each class, to all the common color destroying agencies, the determination of their characteristic properties and their action towards the different fibres, also the determination of the actual money value and coloring power of dyestuffs in terms of a known standard.

Each student is required to make a record of each color tested upon an especially prepared card which furnishes a permanent record of all dyestuffs, their dyeing properties, fastness to light and weather, washing, soaping, fulling, perspiration, bleaching, steaming, ironing, rubbing, acids and alkalies.

Union Dyeing

A study of the principles involved in the dyeing of cotton and wool, cotton and silk, and silk and wool union materials with the production of solid and two color effects.

Textile Printing

A thorough study of the whole subject of textile printing, each student being required to individually produce no less than twenty different prints including the following styles:—Pigment style,

direct printing style, steam style with tanning mordant, steam style with metallic mordant, madder or dyed style, the ingrain or developed azo style, discharge dyed style, discharge mordanted style, resist style, indigo printing, aniline black printing.

The different parts of the calico printing machine are thoroughly studied, also the precautions which must be considered in its use and the arrangement of the dyeing apparatus which must accompany such a machine.

Special attention is paid to the methods of mixing and preparing the various color printing plates that are used in the above work upon the manufacturing scale as well as experimentally in the laboratory.

Cotton Finishing

A study of the various processes of finishing cotton cloth and the different materials used therein. The work involves the discussion of the various objects of cotton finishing and such operations as pasting, damping, calendering, stretching, stiffening and filling, and the various machines used for carrying out these processes.

Mill Visits

During the third year, visits are made to some of the large dyehouses, bleacheries and printworks in the vicinity.

[COURSES II-4, IV-3]

Organic Chemistry Laboratory—C-15

The organic laboratory work includes the preparation of many organic chemicals, the determination of the various constants which establish their purity and a thorough training in organic, analytical and manipulative methods. Several coal-tar dyes are prepared from raw materials obtained by the distillation of coal-tar.

[COURSE II-4]

Engineering Chemistry—C-16

PREPARATION: C-4, C-5, C-6

A series of lectures is given upon the general subject of Engineering Chemistry, which include particularly the consideration of fuels, oils, and water from the chemical engineer's standpoint. The elements of Chemical Engineering are also considered to such an extent as time will permit.

[COURSES II-4, IV-3]

Industrial Analysis—C-17

PREPARATION: C-6

In conjunction with the lectures in Engineering Chemistry there is required a specified amount of laboratory work in the Industrial Analysis Laboratory which has been recently thoroughly equipped with the latest and best apparatus for fuel and oil analysis.

[COURSES II-4, IV-3]

Microscopy and Photomicrography—C-18

The value of the microscope in the detection and examination of the various fibres cannot be overestimated, and often facts may be discovered, and conclusions drawn, which could be arrived at in no other way.

The students in this course are given as much work with the microscope as time will permit. They receive instruction in the use of the high grade microscopes, and not only have practice in the examination and detection of the fibres, but are required to become proficient in the preparation of permanent slides.

Opportunity is also given for students to take photomicrographs of fibres and the various slides which they may prepare. A special dark room has been provided for this purpose.

[COURSES II-4, IV-3]

Thesis—C-19

Before graduation the student must present a thesis which shall consist of a report of some original investigation or research that he has conducted while at the school.

A certain number of hours are specially set aside for this work, and students are encouraged to select some subject for their investigation which shall be of practical as well as theoretical interest.

[COURSE II-4]

Advanced Organic Chemistry (Dyestuffs)—C-20

This course consists of an advanced study of the coal-tar coloring matters, their chemistry, relations of their composition to their coloring power, and the chemistry of their preparation.

[COURSE II-4]

Technical German—C-21

This course consists of the reading of German technical journals with the object of familiarizing the student with the current German publications in Textile Chemistry and Coloring.

[COURSE II-4]

TEXTILE DESIGN AND WEAVING DEPARTMENT—D

Textile Design—D-1

During the first year instruction is given in the subjects of classification of fabrics, use of point or design paper, plain fabrics, intersection, twills and their derivation, sateen, basket and rib weaves, checks and stripes, fancy weaves including figured and colored effects; producing chain and draw from design and vice versa; extending and extracting weaves.

[FIRST TERM—ALL COURSES]

[SECOND TERM—COURSES I-4, I-3, II-3, III-3, VI-3]

Decorative Art—D-1

The instruction in this subject is given in connection with Textile Design, and is conducted entirely by class work. During the first term Freehand Drawing is taught by means of plates and models, and practice in coloring is given in conjunction with this work.

Practice in lettering, spacing and general arrangement of designs and sketches is given. The Engineering alphabet is used in all work.

During the second term instruction is given in drawing, sketching, coloring and designing with reference to their application in textiles. Good examples of applied design in textiles as well as in other branches are used as a basis for modified designs selected and composed by the student. This stimulates originality as well as teaches the student to appreciate good designs and color.

Cloth Analysis—D-1

In the first year this subject takes up in a systematic manner the analysis of samples illustrating the various cloth constructions for the purpose of determining the design of the weave, the amount and kind of yarns used and forms the basis of calculation in the cost of reproducing any style of goods. The various topics discussed are: reeds and setts; relation and determination of counts of cotton, woolen, worsted, silk, and yarns made from the great variety of vegetable fibres; grading of yarns, folded, ply, novelty and fancy yarns; application of the metric system to yarn calculation; problems involving take-up, average counts, determination of counts of yarn, weight of yarn required to produce a given fabric.

[FIRST TERM—ALL COURSES]

[SECOND TERM—COURSES I-4, I-3, II-3, III-3, VI-3]

Hand Loom Weaving—D-1

During the first year the work in hand loom weaving is taken in connection with design and analysis and consists largely of picking-out

patterns and reproducing them in the loom. Instruction is also given in hand dressing, combing, beaming, drawing-in and building harness chains for dobby work.

[FIRST TERM—ALL COURSES]

[SECOND TERM—COURSES I-4, I-3, II-3, III-3, VI-3]

Textile Design—D-2

FOR COTTON GOODS—PREPARATION: D-I

The work of the second year follows with consideration of fancy and reverse twills, diaper work, damasks, skip weaves, sateen fabrics with plain ground, backed fabrics, and multiple ply fabrics. Students are required to make original designs and put the same into the loom. Special attention is given to the consideration of color effects.

The analysis of these fabrics forms a part of the course in design. This also includes the necessary calculations required to reproduce the fabric or to construct fabrics of similar character.

[COURSES I-4, I-3, III-3]

Textile Design—D-3

FOR WOOLEN AND WORSTED GOODS

PREPARATION: D-I

During the second year the instruction given includes warp and filling backed cloths, figured effects produced by extra warp and filling, double cloths, multiple ply fabrics, cotton warps, blankets, bath-robcs, crepes, filling reversibles, Bedford cords, imitation furs, crepons, matelasse and imitations, double plain, ingrains, velvets, corduroys, overcoatings, trouserings.

The analysis of these fabrics together with the consideration of the shrinkages, and dead loss in all fabrics, theory of diameter of yarns, costs of mixer and blends, is a part of this course.

[COURSES I-4, II-3, III-3]

Decorative Art—D-4

PREPARATION: D-I

The work of the second year is similar to that of the previous year, but is more advanced and specific. More original work is required as well as copying and composition work.

[COURSE III-3]

Hand Loom Weaving—D-5

PREPARATION: D-1

In the second year, blanket, Jacquard and leno work are covered, and experiments are made with different weaves and fabrics.

[COURSE III-3]

Textile Design—D-6

PREPARATION: D-2 OR D-3

The advanced work takes up the more complicated weaves adapted to harness work and leads into leno and Jacquard designs. The following is a brief list of the subject heads which will give some idea of the course: Double plain cloths, ingrains, tricots, chinchilla, tapestry, blankets, upholstery, spot weaves, pile or plush, crepon, matelasse and its imitation, pique, Marseilles, quilting, miscellaneous designs for Jacquard, lenos, fustian, tissue fabrics and lappets.

The same plan is pursued during this year as in the second year, that of requiring the student to make original designs and to weave the same.

[COURSES I-4, I-3, II-3, III-3]

Cloth Construction—D-7

PREPARATION: D-2 OR D-3

The work includes the application of the different weaves and their combinations in the production of fancy designs, both modified and original, the calculations involved in the reproduction of standard fabrics changed to meet varying conditions of weight, stock, counts of yarn and value, and the discussion of the breaking strengths of fabrics and relationship of the construction of the fabric to breaking strength.

Instruction in this subject which is given by class room work, is intended to bring together the principles considered under the subjects of design, cloth construction, weaving and yarn making of previous years, and to show the bearing each has in the successful construction of a fabric.

[COURSES I-4, I-3, II-3, III-3]

Decorative Art—D-8

PREPARATION: D-4

Original designs and sketches for particular grades of goods and the study of color effects form the important part of the third year course. It should be understood that work in Decorative Art is carried on in conjunction with textile construction and weaving, particularly on the Jacquard loom. Designs of merit are carefully developed in detail and woven into cloth.

[COURSE III-3]

Decorative Art for Special Students

This course is planned to give a student a working knowledge and appreciation of design. The first and second years are devoted to a general study of design, color, perspective, lettering and rendering. Drawings are made in the Historic styles for all materials—wood, gold, silver, copper, brass, leather, fabrics, wall papers, and glass.

In the third year students should specialize and devote their attention to the material in which they expect to work.

Power Weaving—D-9

PREPARATION: D-1. TAKEN SIMULTANEOUSLY WITH B-5

In connection with the work in Textile Design and Cloth Analysis practical work is carried on upon the power looms. This includes the preparation of warps, beaming, dressing, sizing, drawing-in and making of chains, the cutting and lacing of cards, spooling and quilling and the machinery for the same. A study is made of warpers and sizing machines both for cotton and woolen. Lectures are given to correspond with the progress of the student in the Power Weaving laboratory covering the following subjects:

Loom adjustments, chain building, shuttle changing looms, dobby looms, single and double acting dobbies, handkerchief motions, leno weaving, centre selvedge motions, filling changing looms, oscillating reeds, lappet motions, various shaker motions, towel and other pile cloth weaving, Jacquard looms, single and double lift leno Jacquards, Jacquards of special design, tying up Jacquard harness. The consideration of the mechanical operation and design of the special mechanisms and the calculations involved are taken up by the Engineering Department in the course of weaving mechanism.

[COURSES I-4, I-3, II-3, III-3, VI-3]

Power Weaving—D-10

PREPARATION: D-9; D-2 OR D-3

Instruction is given in weaving on fancy woolen and worsted looms, single and double acting dobbies, leno weaving, various shaker motions, lappet loom weaving, double and single lift Jacquard looms, tying up Jacquard harness, leno Jacquard, harness and box chain building; warp preparation for woolen and worsted and cotton; formulas for making up different kinds of sizing. Lectures are given to correspond with the same.

[COURSES I-4, I-3, II-3, III-3, VI-3]

LANGUAGE AND HISTORY DEPARTMENT—E

English—E-1

PREPARATION: A-5

A technically trained man should be able to express himself clearly, forcibly and fluently, as inability to do so will be a serious handicap to him in after life. The object of the English course is to develop the student's power of expression by a thorough study of the principles of advanced rhetoric and composition and by constant writing of themes illustrative of the four forms of discourse, viz., description, narration, exposition, and argumentation. In addition to the study of rhetoric and composition and the writing of themes, several classics such as are not read in the preparatory schools are studied and discussed.

[ALL COURSES]

Elementary German—E-2

This course is intended for first year students who offer French as an entrance requirement. The work is elementary in character, and much time is devoted to the study of the rudiments of German grammar with practice in composition. During the latter part of the year considerable attention is given to the reading of ordinary German prose, with frequent practice in reading at sight works along scientific and industrial lines.

Advanced German—E-3

PREPARATION: E-2

For students who are pursuing a degree course the elementary course of the first year is continued throughout the second year. The work consists of the reading of scientific German dealing with a variety of subjects, and the translation of commercial German.

[COURSES I-4, II-4]

Elementary French—E-4

This course is intended for first year students who offer German as an entrance requirement. The work is elementary in character, and much time is devoted to the study of grammar and composition. Facility in translation is acquired by a considerable amount of reading from scientific articles.

Advanced French—E-5

PREPARATION: E-4

For students who are pursuing a degree course the elementary course of the first year is continued throughout the second year, and the work is devoted almost entirely to the translation of scientific French.

[COURSES I-4, II-4]

Industrial History—E-6

PREPARATION: A-6

The economic history of a nation is not less interesting or dramatic than its political history, while it is absolutely essential to a thorough understanding of modern business conditions. The object of this course, which is intended for second year students, is to trace the development of the three leading industrial nations of the world, viz., the United States, England, and Germany, from simple, isolated agricultural communities to the complex industrial and commercial society of today. The course consists of weekly lectures supplemented by text-book reading. Among the topics treated are: natural resources; colonization; territorial expansion; manufactures; agriculture; finance; commerce; transportation; revenue tariffs, monopolies; governmental regulation; organization of labor; industrial legislation; immigration, conservation; contemporary problems. During the year each student will be required to write two or more theses on subjects connected with industrial history, in order that he may have practice in research work and also may continue his training in English.

[ALL COURSES]

Economics—E-7

PREPARATION: E-6

This course consists of lectures supplemented by recitations based upon both the lectures and a text book. The character of the course is descriptive rather than theoretical, and the aim is to acquaint the student with the accepted principles of economics and some of their applications to industrial conditions.

Business Administration—E-8

This course covers instruction given under the heading of Business Law, Accounting, Banking, and Efficiency Engineering. These various branches are taken up by means of lectures and text books, and have for an object the acquaintance of the student with business methods and systems in order that he may enter the industry with some knowledge of commercial practice as well as technical processes of manufacturing.

Under the head of Efficiency Engineering the various systems and principles now used to promote efficiency and aid business management are considered with reference to their specific application in the industry.

There are already many examples of successful applications of these principles and these will be available for study.

It is proposed to supplement the work by courses of lectures given by recognized experts in the several branches stated above.

COTTON DEPARTMENT—F

Cotton Yarn Manufacturing—F-1

PREPARATION: B-1, B-3, B-7

Instruction is given by means of lecture and laboratory work. The outline of the course is as follows:

Cotton Fibre

- Development of Cotton Spinning Machinery.
- Botanical Varieties—Their Classification and Characteristics.
- Commercial Varieties—Classifications, Characteristics and Adaptatives.
- Microscopical Examination of Various Cottons.
- Points Considered in Judging Cotton—Dampness, Color, Uniformity, etc.
- Grading and Stapling—American, Egyptian and Sea Island Cottons.
- Methods of Cultivation and Marketing.
- Ginning—Construction, Operation and Advantages of Saw and Roller Gins.
- Baling—Various forms of Baling Presses and their Products, Characteristics of each.
- Mixing—Object and Methods of Mixing for Per cent., Grade, Variety and Color Mixtures.
- Classification of the Processes of the Yarn Manufacture.

Opening and Picking

- Construction and Operation of various machines used in opening and picking cotton, Hopper Bale Breaker, Opener, Automatic Feeder, Breaker, Intermediate and Finisher Pickers, Waste Openers and Cleaning Machines.
- Details of Construction—Cleaning Trunks, Evener Motions, Types of Beaters, Grids and Screens, Lap Measuring Motion, Safety Stop Motion.
- Details of Operation—Regulation of the Air Current, Character and Regulation of the Waste, Drafts of Intermediate and Finisher.
- Adjustment of Feeder, Grid Bars, Lap Racks and Feed Rolls.
- Causes of and Remedies for—Uneven laps, Split laps, Ragged selvages, Dirty laps.
- Cleaning and Oiling.

Carding

- Object and Principles of Carding.
- Construction and Operation of Revolving Flat, Wellman, Foss & Peevey and Roller and Clearer Cards.
- Details of Construction—Feed Plate and Rolls, Screens, Flats, Doffer, Combs, Coiler, Mote-knife, etc.

Card Clothing—Various forms of Foundation, Wire, Method of setting, Number of Points per square foot, Shape and Size of Wire, Methods of Grinding, Method of Cutting Tape and Clothing Cylinder, Doffer and Flats.

Details of Operation—Method of driving various parts, Stripping, Grinding and Burnishing, Setting of various parts, Draft, Speeds and Production, Temperature and Humidity.

Care of Carding Machinery, defects in quality of work and remedies for same.

Character and Regulation of waste.

Sample Carding by hand of at least twelve different blends.

Drawing

Theory of Drawing.

Effect of the Doublings.

Construction and Operation of the Drawing Frame.

Details of Stop Motions, Mechanical and Electrical and advantages of each.

Details of Drawing Rolls, Solid and Shell, Common and Metallic.

Metallic Rolls—Construction, Operation and Advantages.

Roll Covering—Materials used, Roller Cloth, Selection of leather for various kinds of work, methods of applying leather covering.

Roller Varnish—Its object and methods of applying, recipes for same.

Roll weighting for Common and Metallic Rolls.

Setting of Drawing Rolls for Long and Short Staple, Heavy and Light Slivers, etc.

Minor Details—Clearers, Traverse Motion, Weight Relieving Motion, Trumpets and Condensing.

Amount and proportioning of drafts and tension.

Construction and Operation of Railway Head.

Details of Evener Motion, Stop Motions, etc.

Care of Drawing Machinery, Roller Scouring, Cleansing and Oiling, Sizing of sliver, cut sliver and remedies for same.

Roving Processes

Reeling, Weighing and Numbering of Roving by English and Metric Systems.

The Development of the Fly Frame.

Details of Construction of Slubber, Intermediate, Fine and Jack Fly Frames.

Details of the regulation of Draft, Twist, Lay and Tension on fly frames.

Amount of Twist for various cottons and methods of obtaining same.

Builder Motions—English and American types and method of setting and adjusting.

Proportioning and amounts of draft and roller setting.

Creeling, Piercing, Doffing, Cleaning and Oiling.
Stop Motions—Full bobbin. Safety stop, Back Stop motion, Single Roving Stop Motion.
Details of Winding and Regulation of the Tension.
Study of the Differential Motion and its work in the Fly Frame.
Study of the Functions and Development of the Fly Frame Cones.
Defects in adjustment and product of roving machinery and remedies for same.

Ring Spinning and Twisting

Theory of Spinning.
Classification of yarns in regard to uses, materials, varieties and twist.
Reeling, Weighing and Numbering of single and ply yarns.
Construction and Operation of the Ring Frame.
Consideration of Spinning details, thread guides, separators, traveller cleaners, warp and filling bobbins, space of spindles, drum and bands, roving traverse, etc.
Rolls and roll setting, weighting, single and double boss, amount and proportioning of draft for various yarns.
Twist and twist gearing, Amounts for warp, filling and hosiery yarns, ply yarns, etc.
Rings and Travellers, kinds and methods of determining correct size for various yarns.
Comparison of Single and Double Roving in Spinning.
A Study of the development of the modern Spindle.
The Spinning Builder—Study of the Warp Filling and Combination Builder Mechanisms.
Calculations for Speed, Draft, Twist, etc.
Methods of preparing yarn for Twisting.
The Spooler and Multiple Winder.
Operation of Ring and Flyer Twistors.
A Study of the Wet and Dry Twisting Processes.
Care of the rolls, spindles, bands, doffing.
Uneven, cut and cockled yarns and remedies for same.

Mule Spinning

A Comparison of Throstle, Ring and Mule Spinning and the Products of each machine.
Advantages and Disadvantages of each machine.
Construction and Operation of the Self-acting Mule.
Details of Operation, Drawing and Twisting, Backing off, Winding, Re-engaging.
Details of Construction, Builder Motion, Quadrant, Roller Motion, Nosing Motions, Jacking Motions.
A Study of Building and Winding.

Calculation of Draft, Twist, Drag, Production.

Causes of and remedies for Kinky yarn, Soft cops, Ridgy cops, Uneven chase.

Combing

Object of combing.

Kinds of cotton combed and class of goods requiring combed yarns.

Preparing cotton for Combing, Drawing frame, Sliver lapper, Ribbon Machine.

Combinations of preparatory machines and details of operation.

A study of the Heilmann Comber and its operation, Feed Motion, Nippers, Cylinders, Detaching Mechanisms, Draw-box, Draft, Waste and Production, Single and Double Nip Machines.

Setting and Timing the Comber, Regulation of Waste and Production, Weight of lap, etc.

A Study of the Alsation Comber and its Operation.

A Study of the Nasmith Comber and its Operation.

Care and management of combing Machinery.

Organization

Methods of handling Cotton Waste, Details of the manufacture of Cotton Wadding and other Waste Products.

Details of Fine Yarn Spinning, the manufacture of Sewing Thread, Lace Yarns, Twines and Cords.

The Manufacture of Fancy Yarns, Nub, Soop, Splash, Spiral Yarns, Flake Yarns.

Factory Organization for various sizes and styles of yarns, Equipment, Programs, Balance of Production, Cost of Machinery, Power.

The Economic Arrangement of Cotton Machinery.

Life of Cotton Machinery, Depreciation and Valuations.

Factory Cost Systems, Inventory, Productive and Non-Productive Labor, Supplies, Maintenance, General Expense.

[COURSES I-4, I-3, III-3, VI-3]

Knitting—F-2

PREPARATION: F-I OR G-I

The course in Knitting is designed to meet the needs of those requiring special work in this branch, as well as those desiring only a general knowledge of the subject and is taken in the third year. The course begins with lectures upon the yarns used and the preliminary operations, and continues with the construction and operation of the various makes of knitting machines as applied to circular and flat knitting.

Beginning with the hand stocking frame, the student is given instruction upon the machines used for hosiery and the flat machines used in the manufacture of gloves, sweaters and jackets.

Following is a list of subjects taken up :

- Knitting yarns and their Manufacture.
- Operations preliminary to Knitting.
- Winding—Cone Winding, the Payne Winder.
- Development of Knitting.
- Knitting Needles—Their Construction and Operation.
- Latch Needles, Spring Needles.
- Method of Producing Standard Stitches.
- Study of the Plain, Rib and Tuck Stitches and their uses.
- Circular and Flat Knitting Machines.
- Operations involved in the Manufacture of Seamless Hosiery.
- Study of the production of the Rib Top.
- Details of Construction and Operation of the Circular Rib Knitting Machine, including a consideration of Stop Motions, Needle Cams, Pattern Wheels, Splicing Attachments, Measuring Devices.
- Transferring of Rib Tops.
- Details of Construction and Operation of the Seamless Hosiery machine, including a study of Stop Motions, Plating Attachments, Pattern Wheels and Chains, Shaping the Heel and Toe, Reinforcing the Heel and Toe, Loosening the Stitch for Reinforcing and Shaping, Semi, Three-quarter and Full Automatic Hosiery Machines.
- Construction of the Looper and Study of its Operation. Regulation of Tension.
- Designing on Seamless Hosiery Machines—Study of the Production of Fancy Stitches, Designing by means of Colored Threads.
- Size of Yarn for Various Work and Gauges.
- Study of the Finishing of Hosiery—Washing, Dyeing, Boarding, Mending, Pressing, Pairing, Stamping.
- Imperfections in Circular Knit Goods and Remedies for the Same—Dropped Stitches, Curled Work, Ragged Edges, Stains, Streaked Work.
- A Study of the Flat Knitting Machines—The Lamb Principle as applied to Glove and Sweater Manufacture.
- The Jacquard as applied to Flat Knitting Machinery.
- Details of Construction and Operation of Circular Spring Needle Machine—including stitch regulation, adjustment of feeds, take up.
- Tuck Designing on Spring Needle Circular Machines with illustrations.
- Efficiency of Underwear Machines, Production, in yards, pounds and garments.
- Methods of Manufacturing Sweaters, Vests, Scarfs, Mufflers, Caps, etc.
- Method of Manufacturing of Underwear, Union Suits and Two Piece Goods.

[COURSES I-3, II-3]

WOOLEN AND WORSTED DEPARTMENT—G

Woolen and Worsted Yarn Manufacturing—G-1

PREPARATION: B-1, B-3, B-7

Instruction is given by means of lecture and laboratory work, the outline of which is as follows:

Raw Materials

Animal Fibres—Wool, Silk, Mohair, Alpaca, Vicuna, Cashmere, Camel's Hair, etc.

Vegetable Fibres—Cotton, Flax, Hemp, Jute, Ramie.

Wool Substitutes—Noil, Shoddy, Mungo, Extracts.

Waste products manufactured on Woolen Machinery—Cotton Waste, Linters, Flax, Hemp, and Jute Waste.

Sources of supply and relative values of the above.

Chemical and Physical properties and Composition.

Microscopical examination.

Wool Fibre

Physical and chemical structure—Differences between wool, hair and fur.

Physical properties, Strength, Elasticity, Curl, Lustre, etc.

Felting Property—Hygroscopic Property.

Structure and Cause of Kemps.

Definitions of trade terms—Picklock, XXX, XX, 1-2 Blood, 3-8 Blood, 1-4 Blood, Delaine, Braid, etc.

Pulled Wools—Their uses and Classification.

Wool Sorting

Difference between Sorting and Grading—Sorting and Blending.

Judging Spinning Qualities.

Estimating Shrinkage.

Definitions of trade terms—Cots, Hog, Shurled Hogget, Wether, Fries, Paint, Stain, Shoulder, Cast, etc.

Wool Scouring

Object of Wool Scouring

Composition of Yolk and Suint.

Cholesterol and Lanolin.

Materials used as detergents.

Emulsion Process—Use of Soda, Potash, Hard and Soft Soaps.

Manufacture of Scouring Soaps with tests for impurities.

Water in Wool Scouring with tests for hardness, etc.

Effect of heat on Wool Fibre with proper heat of scouring liquor.

Recovery of potash salts and wool fat from waste scouring liquor.

The Solvent process—Degreasing Wool with Naphtha.

Construction and use of Scouring Machines and Rinse Boxes with Speeds, Adjustment and Productions.

Construction and use of Dryers, Table and Artificial.
Effect of heat on Lustre; proper heat for various classes of Wool—
Braid, Botany, Mohair, etc.

Carbonizing

Object of Carbonizing.
Carbonizing Wool, Noils, Burr Waste, Rags.
Carbonizing Agents—Sulphuric Acid, Aluminum, Chloride.
Hydrometers.
Strength of Carbonizing Agents.
Carbonizing with Acid Gases.
Neutralizing.

Burr Picking

Object of Burr Picking—the Wools that are Burr Picked, and the reason that they are not carbonized.
Construction and Use of the several Kinds of Burr Pickers.
Adjustments, Speeds and Production of the same.

Mixing and Oiling

Object of Mixing. Laying down lots.
Mixing Different colors of Wool.
Mixing Wool with Cotton, Shoddy, Noils.
Objects of Oiling—Discussion of Various Kinds of Oils used.
Oil Testing, Viscosity, Flashing Point.
Manufacture of Emulsions.
Construction and Use of Automatic Oilers, Feeds and Pickers.
Speeds, Productions and Calculations for cost of lots when materials of different values are used.

Carding

Principles of Carding.
Functions of various parts—Feed Rolls, Lickerins, Tumblers, Workers, Strippers, Cylinders, Fancies, Dickies, Doffers.
Construction of various parts.
Direction of Revolution and Speeds.
Card Clothing—Construction and uses of the various Kinds of Backing: Leather, Flexifort, etc.; the several kinds of Wire—Garnett, Metallic, Convex, Lickerin, etc.
The "Counts and Crown" method of counting Card Clothing.
Card Adjusting and the use of Card Sets.
Clothing the Card.
Card Grinding and Grinders, Solid Roll, Traverse, Screw and Chain.

Woolen Cards

Construction and use of the First Breaker, Second Breaker and Finisher.

Various methods of coupling Cards.

Card with Breast.

Woolen Card Feeds—Objects, Construction, and use of Automatic Feeds for First Breaker, Bramwell, etc.

The Construction and use of the several kinds of Automatic Feeds for Second Breaker and Finisher, Apperly, Torrance Balling Head and Creel, Bates, Kemp, Scotch, etc.

Condensers, Rub Roll, Combination, Double Apron.

Calculations for Proper Weight of Rovings, Speeds, Productions, etc.

SAMPLE CARDING.—Each student is required to make at least twenty Sample Mixes combining different colors and grades of Stock and to felt and mount the same; part of the carding to be done by Hand Cards and part on the Torrance Sample Mixing Card.

Woolen Mule

Principles of Spinning. History and development.

Hand Jack, Self-operating and Self-acting Mules. The Mule-head.

Methods of driving the various parts, Rolls, Spindles, Carriages, etc.

Backing-off. Winding Mechanism.

Study of the Quadrant and Builder-rail. Regulation of the Fallers.

Double Spinning. Twisting on Mule and on Woolen Twister.

Top Making

CARDING AND PREPARING—The principles of Worsted Carding—Types of Worsted Cards, Double Cylinder Lickerin, Breast.

Speeds, Settings, Feeds, Adjustments, Productions.

PREPARING—Differences between Carding and Preparing—What Wools are Prepared and why they are not Carded. The use of Emulsions. A Set of Preparers. The calculations for Drafts on any Gill Box. The Clough Gill Box.

The proper Drafts in Preparing—Adjustments, Speeds, Productions, Calculations.

GILLING AFTER CARDING—Number of Doublings, etc.

Combing

The principles, history and development of Worsted Combing.

Combing on the Noble and Lister machines.

Calculations for Draft—Settings, Speeds, Productions.

Per cent. of noils.

GILLING AFTER COMBING—Proper Drafts and calculations for Doublings.

BACK WASHING—The object and nature of the process—Backwashing Liquors, Composition, Heat.

The Hydrosopic Property of Wool, Conditioning of Tops, Top Mixing.

Open Drawing or Bradford System

The Principles of Drawing. Numbers of Operations for different counts of yarn. The use of Logarithms in Drawing Calculations. Study of the Drag, Calculations for Drafts and Twists, Proper Ratch.

The functions of the Weigh Box.

Measuring Stop Motions, Candle Stick, Side Knock-off.

Calculations for length.

Construction and use of Gauge Points or Constants.

Effects of Doubling.

The Dram and Hank Systems for numbering Roving.

Cone Drawing

The Object and Use of Cone Drawing, Differential Motions, Builder Motions, Calculations for Draft, Twist-Tension and Lay, Adjustments, Speeds and Productions.

French Drawing

The principles and use of French Drawing—Functions of the Porcupine. The principles of Condensing—Manufacturing of Merino Yarns.

Spinning, Open or Bradford System

The Principles of Spinning. Calculations for Draft and Twist, Spinning on the Cap, Flyer and Ring Frames, The Scaife Builder Motion, Drag in Bradford System of Spinning, the use of Straight, Conical and Bell Mouthed Caps. Top Roll, Single and Double Covered, Iron and Wood.

Types of Frames, Leicester and Illingworth; Speeds, Productions.

Spinning, French System

Principles of Worsted Mule Spinning, Calculations for Draft and Twist, Ratch, Drag, Backing off, Winding, Re-engaging, Size and shape of Caps, Builder Motion, Quadrant, Metric and English systems of Calculations.

Twisting

Principles of Twisting, Reeling, Weighing and Numbering of Single and Ply Yarns, Twisting on Cap, Flyer and Ring Frames, Calculations for Twist, Twist Testing, Trap Twisters, Effect of direction of Twist; Speeds, Productions, Yarn Testing.

The true difference between Woolen and Worsted Yarns. Layout of Machinery for different classes of Yarns, Power required for different machines, Cost of Machinery and Approximate Labor Cost of each Department, Sorting, Scouring, Carbonizing, Picking, Carding, Combing, Drawing, Spinning, Twisting, for various classes of Yarns, Carpet, Braid, Botany.

[COURSES I-4, II-3, III-3, VI-3]

FINISHING DEPARTMENT—H

Woolen and Worsted Finishing—H-1

PREPARATION: C-I, D-I, D-9

The outline of this course which is given by means of lecture and laboratory work is as follows:

Burling and Mending

Under this head is taken up for consideration the examination of flannel as it comes from the loom, the construction, use, and location of the perch, the methods used in marking defects, measuring, weighing, and numbering of cloths, also the methods of inspection for fancies, single cloths, and double cloths. The object of burling, mending, and the types of tables employed, the method of removing knots, runners, etc., the object of back shearing and the use of burling irons, the replacing of missing threads and the importance of sewing as a part of the finishing process, are all considered in detail. The removal of oil and tar spots as well as stains of various kinds is studied.

Fulling

This branch covers a study of the conditions of the flannel as it comes from the loom, the influence of oil, size, etc. upon the procedure. Considerable time is devoted to the various methods of producing a felt, the early types of stocks, hammer falling and crank stocks, and their modifications and development into the present type of rotary fulling mills of both the single and double variety. The details of construction in all machines are carefully taken up and include the design and composition of the main rolls, methods of covering, regulation and means of adjusting the pressures of traps and rolls, consideration of the shoes, the use and regulation of the various types of stop motion, the different types of stretchers, guide rolls, and throat plates.

The theory of felt is taken up and the influence of pressure, moisture, heat, alkali, and acid is considered as well as the hydroscopic and felting properties of different wool fibres. The preparation of the flannel for the mill and the usual methods of determining shrinkages as well as the various methods of soaping are given careful attention. The preparation of various fulling soaps and the value of each for the production of various degrees of felt as well as the determination of the proper amount of alkali for various goods are carefully studied and demonstrated. The manipulation of the various kinds of goods in the mill, viz.: all wool, shoddies, and mixed goods, is studied in class room and by operation in the mill.

The changes in weight and strength for each operation are carefully considered, as is also the value of the flocks made in each. A

study of the various methods of flocking, such as dry and wet are considered in both class and machine rooms. In each operation the defects likely to materialize are studied as well as the cause thereof, and various methods of modifying or lessening them.

Washing and Speck Dyeing

This branch considers the scouring, rinsing and washing of goods both before and after the fulling process; the various types of washers and the details of construction, such as suds, box, rolls, etc. The theory of scouring, uses of Fuller's earth, salt solutions, and sours, on the different kinds of goods is made clear by practical work in the machine room, where the defects due to improper scouring such as stains, cloudy effects, wrinkles and unclean goods, are demonstrated. The discussion of the necessity of speck dyeing follows naturally from the study of these matters and includes methods of preparation, materials used, application and tests required.

Carbonizing

This is an important branch of finishing and includes a study of the various carbonizing agents, methods of application, strength of solutions, and neutralizing, as well as the machines used. Stains and imperfections resulting from carbonizing are also considered. The drying and tentering machines and extractors employed are taken up at this point.

Gigging, Napping and Steaming

The construction in detail of the various types of gigs, nappers, steamers, wet gigs, rolling, stretching, crabbing and singeing machines, is discussed and their actions upon the cloth and the results obtained are explained.

Various methods of obtaining lustre and the production of permanent finish are considered in connection with steaming and sponging.

Brushing, Shearing and Pressing

This includes as do the other branches a careful treatment of the machines employed, the preparation of the cloth for each process, the action of each machine in producing its part of the resultant effect. With the manipulation of the shear comes the matters of setting, grinding, and adjustment. With the brushing machine the effect of steaming and moisture upon the lustre and feel of the goods is shown. A study of the action of the presses both plate and rotary involves consideration of pressure, steaming, etc. Special processes to obtain particular effects are taken up and the part played by each machine is explained. The details involved in handling cloth on a commercial scale, as for example,

measuring, weighing, ticketing, numbering and rolling, are also explained. The necessary calculations and the methods of finishing all grades of goods are considered from time to time during the year.

[COURSES I-4, II-4, II-3, III-3, VI-3]

Cotton Finishing—H-2

PREPARATION: C-1, D-1, D-9

The outline of the course in the Finishing of Cotton Fabrics is as follows:

Cloth Room

Inspection of the various goods and the object thereof. Construction of the various types of inspecting and trimming machines.

Shearing

The object. A consideration of the various types of shears for treating one or both sides at the same time, also the use of the usual cleaning devices, such as emery, sand, and card rolls, beaters and brushes. Grinding and the adjustment of the various parts.

The use of brushing and cleaning machines, rolling devices, and calender attachments, for grey goods.

Singeing

Developing and object of singeing. The construction of singers of all types, and for various purposes. The use of cooling tanks, steaming-devices, rolling and brushing attachments.

Regulation of the flame for various goods and adjustment of the parts. Gas and air pressure, water cooled rolls. The effect of moisture on the cost of singeing. The use of dry cans in connection with singeing. Electric singeing.

Washing

Open width and string washers. Their construction and operation. Soaps, temperature, squeeze rolls. Washing of various goods and the object thereof. Stains.

Napping

The object of napping and the usual method of treating goods. Various types of nappers—Single and Double acting, Felting nappers. Construction, grinding, and adjustment of various types.

Water Mangles

Their object and the construction of various types. Various rolls, iron, husk, etc. Scutchers: their object and construction.

Starch Mangles

The object and construction of all types of starch mangles for pure starch and filled goods. Various types of rolls, brass, rubber, wood. Action of doctor blades, etc. Regulation and object of pressure.

Methods of starching and finishing all standard goods, also a consideration of the various substances used, such as starch, softener, and fillers. The preparation of starch and various methods of application.

Dryers and Stretchers

Both horizontal and vertical, tenter frames, clips. The swing motion and the finishes thus produced. Construction. Spraying machines, belt stretchers, button breakers. Their object and construction.

Calenders

The object and construction of all types, including the regulation of pressure and nips for the production of various finishes. Various types of rolls and their uses, steel, husk, and paper. The use of hot and cold rolls. Chasing, friction, embossing and Schriener calenders, and the various finishes produced by each. Production of watered effects. Beetling machines.

Making up room—yarding, inspecting. Different types of folds. Pressing, papering, marking.

[COURSES I-4, I-3, VI-3]

PHYSICAL CULTURE—I

This subject is required of all students registered for first year work. The course consists of general athletic exercises with small squads on the campus during the pleasant weather of the fall and spring, and exercises in the school gymnasium during the winter months. The instruction is given by the director of physical culture. Previous to the commencement of the work in the fall, each member of the class is required to submit to a thorough physical examination, a careful record of which is kept. Again at the end of the year another examination is held that progress may be noted.

The student's record depends both upon his regularity of attendance and upon the character of his work. A student who is not regular in attendance or who does not make sufficient progress in the work will be required to repeat the subject during the second year.

[ALL COURSES]

Evening Classes

ENTRANCE REQUIREMENTS AND FEES

All applicants to the evening classes must understand the English language and simple Arithmetic. Those who are graduates of a Grammar School are admitted upon certificate. A blank form for this will be found in the back of the catalogue. Those who cannot present such a certificate are required to take examinations in the subjects of English and Arithmetic. In the examination in English a short composition must be written on a given theme, and a certain amount must be written from dictation. In the examination in Arithmetic the applicant must show suitable proficiency in addition, subtraction, multiplication, division, common and decimal fractions, percentage, ratio and proportion. Opportunity to register or to take these examinations is offered each year, generally on the Thursday evenings of the three weeks previous to the opening of the evening school.

There is no tuition fee charged for residents of Lowell attending the Evening Classes. For students from outside of Lowell the tuition is \$5.00 per year for each course taken and is payable in advance.

All students whether from Lowell or elsewhere taking courses in the Chemistry and Dyeing Department must before entering the laboratory make a deposit as follows:

Course IVa	\$ 5.00 per year
Courses IVb, IVc or IVd	\$10.00 per year

This is to cover the cost of laboratory breakage and chemicals, and at the end of the year any unexpended balance is returned or an extra charge made for excess breakage.

The evening classes usually commence the third week of October and continue until about the middle of March. Some classes do not finish until April first. The school is open on four evenings each week during the period mentioned except when the

school is closed for holiday recesses. The schedule showing the arrangements of classes for each term will be announced at the beginning of the school year.

Before entering class all students must fill out an attendance card which can be obtained at the office or from the instructors in the various departments. Any student who has filed an attendance card and who wishes to change his course, should notify the office to that effect.

COURSES

The evening classes offer to those who are employed during the day, instruction pertaining to their daily work or instruction in such branches as are related to the particular department in which they are engaged. Thus, one who is a weaver can carry on a course in Spinning or Designing. A dyer or an employee in a dye house can by means of a course in Chemistry and Dyeing acquire a better and more accurate knowledge of the chemicals and material he is handling during the day. A machinist working on a lathe, planer, milling machine or at a bench, may add to his accomplishments, a knowledge of drafting, mechanism, and other subjects. This means that any man, young or old, who has the fundamentals of a common school education, and who has the determination to advance, may secure in proper sequence the stepping stones to the place toward which he is looking, and rise to even the highest position in the industry.

The courses of the evening school are varied and arranged to meet the special needs of those engaged in the industry. They vary in length from one year to three and at the completion of each course, the certificate of the school is awarded, providing, however, that the student has been in attendance in the course during the year for which the certificate is granted.

No certificate will be awarded until all dues to the school have been discharged.

I. Cotton Spinning—2 Years

In this course the cotton is taken as it is raised in various parts of the world, and instruction is given in the various processes on all the machines from gin to spinning frame and mule.

For one who desires only a study of combing, carding or spinning, it is possible to take that part of the course in which he is particularly interested, although it is believed to be better for a spinner to know something about the machines and processes that precede his own. If one, all his life, has worked with one grade of cotton, an understanding of the other types and grades of cotton, of their properties, methods of cultivation, localities where grown, and uses to which they are adapted, cannot but help to broaden his intellect and make him a more valuable man.

A detailed study of the machines including speeds, drafts, and settings explains and makes clear to the student the arbitrary orders of the mill overseer. There is not time in the mill for explanations as to why a certain change gear is used or how the draft constant is determined. The relative advantages of the many types of mechanisms are considered.

IIa. Woolen Spinning—2 Years

IIb. Worsted Spinning—3 Years

In both courses the students of the first year pursue the same class work covering instruction in the many kinds of wool, the varying properties of the fibres, trade terms, sorting, scouring, carbonizing, etc. This work is followed by instruction in carding and mule spinning for the woolen students. For those desiring to study worsted yarn manufacture work is taken up on the worsted card, followed by gilling and combing and processes of top making. The last year of this course is devoted to a study of worsted yarn manufacture on both the English and French systems.

Thus in three years' time one may acquire a thorough course of instruction in worsted yarn manufacturing, or in two years, a knowledge of woolen yarn manufacture. He is thus able to obtain a knowledge of machines and processes that could not be obtained in the ordinary course of events in the mill.

IIIa. Textile Design—3 Years

For one who is working in the design, pattern or weave room, the course in design offers instruction in the great variety of weaves, in cloth construction and analysis. It is practically

impossible under ordinary circumstances for one to acquire in the mill a knowledge of the construction of the many textile fabrics. Where a person spends the greater portion of his life in one or two mills, his knowledge of fabrics is confined to those made in the mills in which he works. A course in designing supplements the experience received during the day, thus broadening a person's textile knowledge as well as making him better acquainted with the fabrics upon which he works daily.

IIIb. Freehand Drawing—3 Years

In the course in Freehand Drawing, instruction is given in the drawing from models, casts and designs. Work is taken up in charcoal and also in colors. This course has appealed to many young women of the city and it is believed that this is a most fortunate opportunity for both young women and young men of Lowell to acquire the elements of artistic designing.

IVa. Elementary Chemistry—2 years

General Chemistry including Inorganic and Organic. Qualitative Analysis.

IVb. Textile Chemistry and Dyeing—3 years

Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Dyeing.

IVc. Analytical Chemistry—3 years

Laboratory Work and Lectures in Quantitative Analysis.

IVd. Textile and Analytical Chemistry—4 years

Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Analytical Chemistry.

Hardly any branch of applied science plays so important a part in our industrial world as Chemistry. Many large mills employ the chemist as well as the dyer, and with the great progress which is being made in the manufacture and application of dyestuffs, a basic knowledge of chemistry becomes an absolute necessity to the dyer. Within a comparatively short distance from Lowell are establishments employing men who require some knowledge of chemistry but who may not necessarily use dyes. Some find a knowledge of analytical chemistry helpful in their everyday work.

To meet these varying needs of our industrial community, the school offers a two year course in General Chemistry, Organic and Inorganic, which may be followed by any one of three courses, viz., Textile Chemistry and Dyeing, Analytical Chemistry and Textile and Analytical Chemistry. In order to take Courses IVb, IVc or IVd, candidates must have a certificate from Course IVa, or show by examination or approved credentials that they have taken the equivalent of the work covered by this course.

- Va. Cotton Weaving—1 year**
- Vb. Woolen and Worsted Weaving—1 year**
- Vc. Dobby and Jacquard Weaving—1 year**

These are called weaving courses, but in reality they might more properly be called courses in loom fixing for particular attention is given to the mechanism of the looms, the timing of the various parts and the adjustments possible to produce desired results. Here again, is an opportunity for students to fix, dismantle, erect and adjust looms in a way that could not be tolerated in any mill. Frequently students come to the classes with the knowledge that certain adjustments must be made upon a loom if certain results are to be obtained, but the reason for these is not known. The school offers the machine, time and instructor in order that the weaver, or loomfixer, may determine for himself the reason for some rule which he practices in his daily work. Not only can he become more familiar with the loom upon which he works every day, but he can study the operations of many other makes of looms.

- VIa. Elements of Engineering—3 years**
- VIb. Mechanical Drawing—3 years**
- VIc. Machine Shop Practice—2 years**

These courses have been arranged with the object of offering to those engaged in the mechanical and electrical departments of our mills, opportunities to learn something concerning the theory underlying the many practical methods which they pursue during the day.

Under the head of Elements of Engineering is given instruction in Mechanics and Mechanism of machines for one

year, followed by a year's course on steam boilers and engines with the auxiliary apparatus found in a modern steam plant. In the third year a brief course in Applied Electricity takes up, as far as time will permit, instruction in alternating and direct current generators, motors and apparatus.

For one having occasion to make a sketch or detail drawing for the purpose of illustration or instruction, or for one who is daily required to work from a drawing or blue print, the course in Mechanical Drawing is offered. It first lays a foundation of the principles of mechanical drawing and follows this with two years' work in drawing directly from parts of machines, preparing both the detail and the assembly drawing.

The Machine Shop Course is almost self-explanatory. The school has one of the best equipped shops for instruction purposes in this vicinity. Nearly all of the standard machine tools are represented, and it is possible to do almost any kind of machine tool work which comes within the range of the tools.

Thus it becomes possible for one who may be working at the bench during the day to learn how to operate a lathe or other tool, or for a lathe hand to acquire a knowledge of a planer, shaper, milling machine, grinder, etc. A man who has a knowledge only of the special machine which he operates, may by means of this course, become a more intelligent machinist. He should supplement this course with the courses in Mechanical Drawing and Mechanism in order that his training for an all-round machinist or mechanic may be more complete.

VII. Woolen and Worsted Finishing—1 year

In this course machine work is supplemented by lectures and discussions pertaining to the many finishes given to woolen and worsted fabrics. The action of soaps, water, steam, heat and cold upon wools in cloth or the combination of this fibre with others used in commerce is carefully studied. This course also helps the finisher to broaden his knowledge of textile fabrics.

OFFICERS OF ADMINISTRATION AND INSTRUCTION

Principal

CHARLES H. EAMES, S.B., Massachusetts Institute of Technology, 1897. Experience: Secretary of the Lowell Textile School and instructor in electrical engineering and mathematics; superintendent, Light, Heat and Power Corporation, Lowell, and engineer with Stone and Webster, electrical engineers, Boston, Mass.

Instructors

TEXTILE ENGINEERING

GEORGE H. PERKINS, S.B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience: Draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood Greene and Co., Boston, Mass.

HERBERT J. BALL, S.B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906. Experience: Draftsman, Watertown Arsenal.

ULYSSES J. LUPIN, S.B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: Draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.

ERNEST J. BATTY, S. B., assistant instructor in mechanical drawing. Institute of Technology, 1911. Experience: Draftsman; Narragansett Machine Company, Pawtucket, R. I.

CHARLES H. JACK, instructor in machine shop practice. Lowell Textile School. Experience: Amoskeag Manufacturing Company, Manchester, N. H.

CHEMISTRY AND DYEING

LOUIS A. OLNEY, A. C., M. S., chief instructor. Lehigh University, 1896. Experience: instructor, Brown University; dyeing and finishing department, Stirling Mills, Lowell, Mass.

MILES R. MOFFATT, S.B., instructor in chemistry. Columbia University, 1901. Experience: assistant instructor in physics, Columbia University; chemist, Mallinckrodt Chemical Works, St. Louis, Mo.; chemist, Atlantic Mills, Providence, R. I.

ROBERT R. SLEEPER, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday and Sons, Limited, New York City; H. A. Metz and Co., New York City; Hamilton Print Works, Lowell, Mass.; Merrimack Manufacturing Company, Lowell Mass.

- HOWARD D. SMITH, Ph. D., instructor in chemistry. Tufts College, 1906; Brown University, 1904; Rhode Island College, 1901. Experience: assistant instructor, Brown University and Tufts College; instructor, Beloit College, Wisconsin.
- ROBERT KIRKPATRICK, A. B., assistant instructor in chemistry. Clark College, 1911.
- REGINALD S. BOEHNER, M. Sc., instructor in chemistry. Dalhousie University, 1901; McGill University, 1906; and University of Berlin. Experience: instructor, McGill University.
- WALTER E. HADLEY, instructor in chemistry. Lowell Textile School, 1908.
- JOHN C. STANDISH, assistant instructor in dyeing. Lowell Textile School, 1911.

TEXTILE DESIGN AND WEAVING

- HERMANN H. BACHMANN, chief instructor. Gera Textile School, Germany. Experience: Gustav Weise Public Designing House for the City of Gera; Parkhill Manufacturing Company, Fitchburg, Mass.; Lorraine Manufacturing Company, and Smith Webbing Company, Pawtucket, R. I.
- STEWART MACKAY, instructor in textile design and cloth analysis. Lowell Textile School, 1906. Experience: Bay State Mills, Lowell, Mass.; George C. Moore Wool Scouring Mills, North Chelmsford, Mass.
- STARR H. FISKE, assistant instructor in design and weaving. Lowell Textile School, 1909. Experience: Amoskeag Manufacturing Company, Manchester, N. H.
- JOSEPH WILMOT, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.; Draper Company, Hopedale, Mass.; Crompton and Knowles Loom Works, Worcester, Mass.
- ALBERT E. MUSARD, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder and Ellis, Philadelphia, Pa.
- E. ELIZABETH WHITNEY, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching eighteen years.

COTTON YARNS

- STEPHEN E. SMITH, chief instructor. Lowell Textile School, 1900. Experience: draftsman, Lowell Machine Shop, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.
- HERBERT C. WOOD, instructor in cotton yarns. Lowell Textile School, 1906. Experience: Tremont and Suffolk Mills, Lowell; Whitin Machine Works, Whitinsville, Mass.
- HENRY K. DICK, instructor in knitting. Experience: Linnville Hosiery Factory, Lanark, Scotland.

WOOLEN AND WORSTED YARNS

- EDGAR H. BARKER, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, Mass.; wool scouring.
- JOHN N. HOWKER, instructor in wool sorting and scouring. Technical School of Saltaire near Bradford, England; certificate from City and Guilds of London. Experience: Saltaire Mills, Yorkshire, England; Goodall Worsted Company, Sanford, Maine; Arlington Mills, Lawrence, Mass.
- EUGENE C. WOODCOCK, instructor in woollen and worsted yarns. Lowell Textile School, 1907. Experience: Wood Worsted Mills, Lawrence, Mass.
- JOHN C. LOWE, instructor in woollen and worsted yarns. Lowell Textile School, 1911. Experience: Wood Worsted Mills, Lawrence, Mass.

FINISHING

- ARTHUR A. STEWART, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woolen Manufacturing Company, Montreal, Canada; American Woolen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor in woollen and worsted yarns, Lowell Textile School.

LANGUAGES AND HISTORY

- LESTER H. CUSHING, A. B. Harvard College, 1911.

PHYSICAL CULTURE

- RALPH E. GUILLOW, physical director. International Y. M. C. A. Training School, Springfield, Mass., 1910. Ten years' experience in physical culture in various schools and institutions.
- ARCHIBALD R. GARDNER, M.D., medical adviser. Harvard University, 1902.

ALUMNI ASSOCIATION

The Alumni Association of the School holds its annual meeting and banquet in Lowell on commencement day.

The membership of the Association is restricted to graduates of the day school. Honorary membership is open to the Board of Trustees, the Faculty and such others as may be elected by the Association.

The officers for year ending June, 1912 are:

President:	Thomas T. Clark, '10
Vice-President:	Everett B. Rich, '11
Secretary-Treasurer:	Arthur A. Stewart, '00

Board of Directors: The President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, for one year, and Stephen E. Smith, '00, for two years. Communications should be addressed to Arthur A. Stewart, Lowell Textile School.

THE SOUTHWICK TEXTILE CLUB

The object of the Club is to promote the welfare of the School and the social and intellectual interests of its past students.

The membership is restricted to all persons who have attended the day classes of the School for at least one year who are not, at the time of making application to the Club, students thereof.

The Club was organized on February 23, 1907, and at present has about seventy-five members. The officers of the Club are:

President:	Royal P. White, '04
Vice-President:	Arthur C. Varnum, '06
Secretary-Treasurer:	Arthur A. Stewart, '00

Executive Board: President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, and Stephen E. Smith, '00.

OLNEY CHEMICAL ALUMNI OF THE LOWELL TEXTILE SCHOOL

This association was organized in 1908, for the purpose of keeping its members in closer relationship with each other and the school.

The membership consists of evening graduates from any of the advanced courses in chemistry and dyeing of the Lowell Textile School, and is composed of thirty members at present.

The annual meeting is held during the winter months at the school,

and the annual reunion is held the third Saturday of June at a place selected by the Board of Control.

OFFICERS

President:	Hugh Christison, Methuen, Mass.
Vice-President:	James Spurr, Lawrence, Mass.
Secretary and Treasurer:	H. Stewart Redman, Lowell, Mass.

BOARD OF CONTROL

President, Vice-President, Secretary, also John A. Barrington of Philadelphia, Pa.; Fred Snow of Lowell, and Harry Buckley of Methuen, Mass.

O. C. A. PRIZE COMMITTEE

H. Stewart Redman
Forster G. Heaton
Peter F. O'Neil

This association will offer each year a prize to the evening graduate of the chemistry and dyeing courses considered most worthy.

For information regarding this association please apply to H. Stewart Redman, Secretary, 442 Beacon Street, Lowell, Mass.

DAY CLASS OF 1911

Graduates with Titles of Theses

Diplomas awarded as follows, June 2, 1911:

Tracy Addison Adams,	Chemistry and Dyeing, "A Treatise on Leather Dyeing."	East Bridgewater, Mass.
Walter James Bailey,	Chemistry and Dyeing, "The Manufacture of Acetylene Tetrachloride which is not contaminated by Iron."	Watertown, Mass.
Howard Mills Blaikie,	Wool Manufacturing, "The Manufacture of a Worsted Suiting."	Medford, Mass.
Elliott Francis Cameron,	Chemistry and Dyeing, Thesis with H. W. Martin, "The Analysis of Lactic Acid."	Beverly, Mass.
Proctor Ralph Chandler,	Chemistry and Dyeing, "Action of Alkalies on Worsted Yarn."	North Andover, Mass.
Lester Bury Chisholm,	Cotton Manufacturing, "The Production of a Cotton Dress Goods."	Melrose Highlands, Mass.
Maurice William Dewey,	Wool Manufacturing, "The Manufacture of a Worsted Serge."	Lowell, Mass.
Thomas Patrick Flynn,	Chemistry and Dyeing, "Fastness to Rubbing of Basic Colors on Cotton."	Fitchburg, Mass.
Edgar Robinson Ford,	Chemistry and Dyeing, "Analysis of Bleaching Assistant."	Lawrence, Mass.
Francis William Gainey,	Chemistry and Dyeing, "Different Color Effects produced by Union Dyeing."	Lawrence, Mass.
Ernest Crawford Hay,	Wool Manufacturing, Thesis with A. S. Walker, "The Manufacture of a Worsted Suiting."	Pittsfield, Mass.
Walter Alexander Hendrickson,	Wool Manufacturing, Thesis with R. A. Toshach, "The Manufacture of a Worsted Suiting."	Wakefield, Mass.
Ralph King Hubbard,	Chemistry and Dyeing, "Dyeing of Cotton and Wool Union Material with the Object of Establishing the General Rules Applicable in the Majority of Cases."	Norwood, Mass.
John Horace Hunton,	Wool Manufacturing, "The Manufacture of a Worsted Suiting."	Lowell, Mass.
Harry Warren Martin,	Chemistry and Dyeing, Thesis with E. F. Cameron.	Marblehead, Mass.
Allan Blanchard Merrill,	Chemistry and Dyeing, "Titanium Potassium Oxalate and its Uses in Various Textile Coloring Processes."	Lynn, Mass.

- Karl Remick Moore, Chemistry and Dyeing, Newton Highlands, Mass.
 "Comparison of the Fastness of Mercerized and Unmercerized
 Cotton Yarn to the Common Color Destroying Agencies."
- Clarence Edward O'Connell, Chemistry and Dyeing, Andover, Mass.
 Thesis in 1910,
 "Photo-micrographic Study of the Fibres."
- Alfred Henry Pearson, Chemistry and Dyeing, Springvale, Maine.
 "Fastness of Colors to Sunlight in a Vacuum and
 in the Presence of Different Gases."
- Everett Blaine Rich, Textile Design, Worcester, Mass.
 Thesis with J. P. Morris,
 "The Manufacture of a Worsted Suiting."
- Leon William Sidebottom, Chemistry and Dyeing, Lowell, Mass.
 "Study of the Mixing of Reduction Vat Colors
 to Obtain Compound Shades."
- John Carver Standish, Chemistry and Dyeing, Dighton, Mass.
 "The Use of Formic Acid as a Mordanting Assistant."
- Reginald Alexander Toshach, Wool Manufacturing, Methuen, Mass.
 Thesis with W. A. Hendrickson.
- Alfred Schuyler Walker, Wool Manufacturing, Malden, Mass.
 Thesis with E. C. Hay.
- William Watson, Textile Design, Haverhill, Mass.
 "Color Combinations Applied to Textile Fabrics."
- Ernest Hadley Wood, Chemistry and Dyeing, Andover, Mass.
 "A Comparison of the Value of Various Oils as Wool Lubricants."

EVENING CLASS OF 1911

Certificates awarded as follows, May 3, 1911:

COURSE I—2 YEARS. (Cotton Spinning)

Oliver Andrews	Lowell, Mass.
Joseph Barnes	Andover, "
Albert Adelard Fournier	Lowell, "
Marcus Harriman Hartwell	" "
James Albert Nelson	" "
Preston Newall	" "
John Fletcher Rogers	" "
George Stewart	" "
Frank Ledyard Walton	" "

COURSE IIb—3 YEARS. (Worsted Spinning)

William Ernest Ballinger	North Chelmsford, Mass.
Howard Haines Murphy	Lowell, "
Clarence Roy Perry	Lawrence, "
John Raymond Stanley	North Chelmsford, "

COURSE IIIa—3 YEARS. (Textile Designing)

Bernard Daniel Ward	Lowell, Mass.
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COURSE IIIb—3 YEARS. (Freehand Drawing)

Melina Lachance	Lowell, Mass.
Marie Emelia Racicot	" "

COURSE IVd—5 YEARS. (Textile and Analytical Chemistry)

Hugh Christison	Methuen, Mass.
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COURSE IV—4 YEARS. (Chemistry and Dyeing)

Forster Gordon Heaton	Lowell, Mass.
George Henry Smith Logan	Lawrence, "

COURSE IVa—2 YEARS. (Elementary Chemistry)

Percy Bastow	Methuen, Mass.
Charles Hartley Birkby	Lowell, "
Alexander Nicholas Gakidis	" "
Edward Miller Glennon	Lawrence, "
Alfred Leonard Gustafson	Lowell, "
Joseph Frederick Linberg	" "
James Brandon Manning	" "
Phillips Brooks Marsden	Lawrence, "
Samuel Jennings Nichol	Lowell, "
William Arthur Pedler	Methuen, "
Orlo Foster Stearns	Chelmsford, "
George Stewart	Lowell, "

COURSE Va—1 YEAR. (Cotton Weaving)

Oliver Andrews	Lowell, Mass.
Edward James Cox	" "
Heisayu Fujiyoshi	" "
Marcus Harriman Hartwell	" "

Arthur Lemire	Lowell, Mass.
Harold Rowlands	Needham, "
John Joseph Shields	Lowell, "
Allen Reed Williams	" "
Frederick William Wollin	" "

COURSE Vb—1 YEAR. (Woolen and Worsted Weaving)

Thomas Patrick Carty	Lowell, Mass.
Michael Joseph Delaney	" "
Ernest Winslow Dodge	" "
William Flaherty	" "
Ross Goodwin	" "
John Manus Handley	" "
Charles William Hanslip	Collinsville, "
Thomas McNamara	Lowell, "
Prescott Robert Parkin	" "
Francis Joseph Perron	North Andover, "
Frank James Wade	Lowell, "
Frederick James Wright	" "

COURSE Vc—1 YEAR. (Dobby and Jacquard Weaving)

James Francis Burke	Lowell, Mass.
George Edward Hibbert	" "

COURSE VIa—3 YEARS. (Mechanics and Electricity)

John Albert Carpilio	Lawrence, Mass.
Thomas Dulligan	Lowell, "
William Hodge	Andover, "
William Edward Kennedy	Lawrence, "
Herbert James Wilmott	Lowell, "

COURSE VIc—3 YEARS. (Architectural Drawing)

Joseph Emile Milot	Lowell, Mass.
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COURSE VIb—3 YEARS. (Mechanical Drawing)

William Frank Brown	Lowell, Mass.
John Cochrane	" "
George William Cote	" "
Hubert Ronald Dean	Methuen, "
Charles Edward Newsholme	" "
Nathan Allen Nichols	Lowell, "
Joseph Arthur Tennant	Methuen, "

COURSE VIId—2 YEARS. (Machine Shop Practice)

John Francis Downs	Lowell, Mass.
Joseph Francis Garrity	" "
Sigfred Nelson	" "
William Andrew Shaffer	" "

COURSE VII—1 YEAR. (Woolen and Worsted Finishing)

William Edward Herrick	Dracut, Mass.
James Edward Robinson	Lowell, "
Ruddach Palmer Robinson	" "

REGISTER OF DAY STUDENTS

1911-1912

Third Year

Name	Course	Address
Bigelow, Prescott F.	II	Jamaica Plain, Mass.
Branson, Frank L.	Sp. I	Athens, Ga.
Brown, Rollins	IV	Salem, Mass.
Casey, Henry F.	VI	Roxbury, "
Coan, Charles B.	IV	Ward Hill, "
Conant, Richard G.	I	Littleton, "
Crane, Edwin M.	I	Blackstone, "
Dalton, Gregory S.	IV	Lawrence, "
Dalton, John, Jr.	IV	North Adams, "
Daw, Arthur J.	IV	North Andover, "
Dearth, Elmer E.	IV	Lowell, "
Demuth, Herbert E.	IV	Lisbon Falls, Me.
Elliot, Gordon B.	II	Grafton, Mass.
Engstrom, Karl E.	VI	Lancaster, "
Frost, Harold B.	II	Somerville, "
Fujiyoshi, Heisayu	Sp. I	Japan
Goodale, William P.	I	Clinton, Mass.
Hartshorn, George T.	II	Norwood, "
Hassett, Paul J.	IV	Fitchburg, "
Hathaway, Henry B.	Sp. III	Salem, "
Holmes, Otis M.	VI	Haverhill, "
Hood, Leslie N.	IV	Nashua, N. H.
Lamont, Robert L.	II	Malden, Mass.
Leitch, Harold W.	IV	North Andover, "
Munroe, Sydney P.	I	Melrose, "
Murphy, Howard H.	Sp. II	Boston, "
Niven, Robert S.	VI	Saugus, "
Pensel, George R.	IV	Fitchburg, "
Pottinger, James G.	II	West Roxbury, "
Preston, Harold L.	II	Woonsocket, R. I.
Roche, Raymond V.	IV	Uxbridge, Mass.
Rundlett, Arnold D.	VI	Haverhill, "
Shea, Francis J.	II	Ware, "
Sullivan, John D.	VI	Bradford, "
Thaxter, Joseph B., Jr.	II	Hingham, "
Weeks, Harry F.	II	Malden, "
Whitehill, Warren H.	IV	Groton, "
Whittier, Sumner C.	IV	Reading, "
Yavner, Harry	II	Somerville, "

Second Year

Ayers, Iverne C.	VI	Clinton, Mass.
Beard, George H.	Sp. IV	Acworth, N. H.
Bennett, Herbert B.	II	Lowell, Mass.
Burke, Henry B.	IV	South Acton, "
Church, Harold P.	III	Providence, R. I.
Cleary, Charles J.	II	Boston, Mass.
Cogswell, Wilder D.	II	Bradford, "

Name	Course	Address
Cook, Kenneth B.	I	Concord, Mass.
Creese, Guy T.	IV	Danvers, "
Davieau, Arthur N.	VI	Cochituate, "
Davis, Alexander D.	VI	Lowell, "
Dearborn, Roy	VI	Andover, "
Dover, James A.	VI	Winchester, "
Feindel, Catherine E.	Sp. III	Chelmsford Centre, "
Gadsby, Arthur N.	II	North Adams, "
Horton, Chester T.	VI	Wilmington, "
Johnson, Arthur K.	IV	Andover, "
Kaplan, Maurice	IV	Boston, "
Kelsey, Oscar E.	VI	Lowell, "
Lillis, Marvin H.	IV	Lawrence, "
Madden, Francis P.	I	Revere, "
Mather, Harold T.	VI	Lowell, "
Minis, Carol E.	I	Savannah, Ga.
Murray, James	IV	Lawrence, Mass.
O'Neill, Charles F.	Sp. IV	Lowell, "
Peck, Carroll W.	IV	Hanover, Conn.
Pillsbury, Ray C.	I	Manchester, N. H.
Pinanski, Samuel	III	Dorchester, Mass.
Plummer, Elliott B.	IV	Lawrence, "
Poor, Nathan H., 2nd	IV	Danvers, "
Putnam, Philip C.	IV	" "
Rayner, Charles H.	IV	Waltham, "
Richardson, Richardson P.	I	Lowell, "
Ryder, Howard W.	I	Malden, "
Sampson, Albert E.	Sp. IV	Gorham, Me.
Sampson, Arthur H.	Sp. IV	" "
Shambow, John C.	Sp. VI	Woonsocket, R. I.
Shedd, Howard P.	IV	West Medford, Mass.
Stubbs, Samuel A.	Sp. IV	Haverhill, "
Sylvain, Charles E.	VI	Lowell, "
Walen, Ernest D.	VI	Gloucester, "
Ward, Herbert H.	II	Gilbertville, "

First Year

Abbott, Fred A.	II	Dexter, Me.
Adams, Arnold B.	VI	East Bridgewater, Mass.
Ballard, Albert P.	IV	Malden, "
Barta, Elliot	I	Winchester, "
Bellefontaine, Edgar P.	IV	Lowell, "
Blake, Parker G.	VI	Cambridge, "
Bradley, Raymond F.	VI	Gloucester, "
Brickett, Raymond C.	II	Haverhill, "
Casey, William F.	I	Allston, "
Childs, Calvin W.	III	Lexington, "
Christie, Grover W.	IV	Bradford, "
Cleaves, William S.	I	Beachmont, "
Colby, Lawrence W.	IV	Andover, "
Comey, Francis W.	I	Melrose, "
Cosendai, Edwin F. E.	IV	Saginaw, Mich.
Crawford, John W.	IV	Lawrence, Mass.
Dawson, George I.	VI	Somerville, "
Dimock, Dwight L.	IV	Billerica, "

Name	Course	Address
Dorr, Clinton L.	VI	Malden, Mass.
Edgecomb, Fred H.	I	Salem, "
Fisher, Russell T.	VI	Gloucester, "
Fletcher, Howard S.	Sp. III	Lowell, "
Folsom, Harold G.	IV	Newburyport, "
Gage, Winthrop H.	I	Somerville, "
Greer, John H., Jr.	IV	Lawrence, "
Hamilton, Robert M.	III	Winchester, "
Hatchard, George P.	VI	Allerton, Hull, "
Herbsman, Abraham M.	IV	Boston, "
Hesseldin, William	Sp. III	Lowell, "
Hurld, Henry M.	IV	Stoneham, "
King, James F.	I	Shanghai, China
Kitchen, Everett M.	II	Foxcroft, Me.
Kyle, George S.	I	Columbus, Ga.
Lamb, Horace E.	II	Rockland, Me.
Lane, Oliver F.	IV	Lowell, Mass.
Laughlin, Edwin T.	IV	Cohoes, N. Y.
Lawson, Edward R.	VI	Andover, Mass.
Leffingwell, Raymond D.	I	Burlington, Vt.
Maguire, Daniel H., Jr.	IV	Haverhill, Mass.
Mahony, William J.	—	Winthrop, "
McArthur, Osborn	II	Watertown, "
McCreery, Robert W.	I	Glens Falls, N. Y.
McGowan, Frank R.	VI	Lowell, Mass.
McNeillis, Robert E.	I	Arctic, R. I.
Messenger, George A.	IV	Chicopee Falls, Mass.
Messer, Ralph W.	VI	Billerica, "
Miller, Severn A.	III	Montclair, N. J.
Mitchell, Nicholas L.	Sp. III	Hull, Mass.
Mulvey, Patrick J.	III	Millville, "
Newell, Herbert M.	I	Pawtucket, R. I.
Neyman, Julius E.	IV	Lowell, Mass.
Paige, Lester P.	III	Manchester, "
Pearl, Lloyd M.	II	Johnson, Vt.
Peckham, Robert B.	III	Newton Highlands, Mass.
Pike, James H.	VI	Waltham, "
Rich, Edward	IV	Manchester, N. H.
Richardson, George O.	IV	Andover, Mass.
Richardson, Leroy	Sp. IIIb	Lowell, "
Robbins, Ray N.	II	East Acton, "
Robertson, George O.	II	Lowell, "
Rooney, James H.	II	" "
Ross, Ernest E.	VI	Stoneham, "
Rowe, Frank E., Jr.	VI	Winchester, "
Sawyer, Joseph W.	IV	Lawrence, "
Schofield, Percy W.	II	Lowell, "
Stevens, Harold S.	II	Haverhill, "
Strauss, Moses	I	Lowell, "
Taft, Leroy C.	II	Union, N. H.
Thomson, Alexander	II	Malden, Mass.
Tucker, Harold B.	VI	Stoneham, "
Ware, Carl E.	I	Peabody, "
Washburn, Frederick A.	I	Malden, "
Woods, Thomas J.	II	Somerville, "

Post Graduates

Name	Address
Barr, I. Walwin	New York, N. Y.
Brickett, Chauncy J.	Scranton, Pa.
Carter, Robert A.	South Amboy, N. J.
Cole, James T.	Belmont, Mass.
Culver, Ralph F.	Norwood, Mass.
Foster, Clifford E.	South Manchester, Conn.
Haskell, Walter F.	Westbrook, Me.
Hildreth, Harold W.	Lawrence, Mass.
Hollings, James L.	Brooklyn, N. Y.
Jenckes, Leland A.	Chicopee, Mass.
Knowland, Daniel P.	New York, N. Y.
Mailey, Howard T.	Lawrence, Mass.
Moorhouse, William R.	Boston, Mass.
Reynolds, Fred B.	North Andover, Mass.
Sleeper, Robert R.	Lowell, Mass.

REGISTER OF EVENING STUDENTS

1911-1912

Explanatory Note

Course I Cotton Spinning
 Course II (a) Woolen Spinning
 Course II (b) Worsted Spinning
 Course III (a) Designing
 Course III (b) Freehand Drawing
 Course IV (a) Elementary Chemistry
 Course IV (b) Textile Chemistry and Dyeing
 Course IV (c) Analytical Chemistry
 Course IV (d) Textile and Analytical Chemistry
 Course IV (e) Special Chemistry
 Course V (a) Cotton Weaving
 Course V (b) Woolen and Worsted Weaving
 Course V (c) Dobby and Jacquard Weaving
 Course VI (a) Mechanics and Electricity
 Course VI (b) Mechanical Drawing
 Course VI (d) Machine Shop
 Course VII Woolen and Worsted Finishing
 Course VIII Knitting

Post Graduate

Name	Course	Address
Gookin, Alice L.	IIIb	Lowell, Mass.
Lachance, Melina	IIIb	" "
Ledoux, Blanche H.	IIIb	" "
Lemire, Arthur	I	" "
Racicot, Marie E.	IIIb	" "
Root, Francis X., Jr.	IIIa	" "

Third Year

Arnold, Wm. W., Jr.	VIa	Lowell, Mass.
Blanchette, Eugene	IIIb.	" "
Boije, Walter F.	IIb	" "
Buzzell, Fred S.	IIa	Methuen, "
Campbell, Alexander	VIa	Lowell, "
Carr, Wm. T.	VIa	" "
Casey, Henry F.	VIa	" "
Christenson, John O.	VIb	" "
Cogger, Frank P.	VIa	" "
Dickey, Nelson P.	VIa	" "
Dittman, Ralph A.	IIIa	Haverhill, "
Dollbaum, John A.	IIIa	Lowell, "
Ekengren, Hilding	IIIb	" "
Fagan, Thomas M.	VIb	" "
Fales, Raymond D.	VIa	" "
Garrity, Joseph F.	VIa	" "
Goodale, Wm. P.	VIa	" "
Graves, John F.	VIb	" "
Guiney, John P.	VIa	" "

Name	Course	Address
Harrison, Henry	VIa	Lowell, Mass.
Higginson, Joseph H.	IIIa	Haverhill, "
Hogg, Frank H.	IIb	Lowell, "
Holland, Walter F.	IIIa	Lawrence, "
Johnson, Henry L.	VIa	Lowell, "
Judge, Martin	IIb	Lawrence, "
Kent, Arthur	VIIb	Lowell, "
Kerrigan, Arthur J.	VIa	" "
Knowlin, George J.	VIa	North Chelmsford, "
Lambert, Harry	IIb	Methuen, "
Lang, Wm. A.	VIa	Lowell, "
Lapierre, Alderic	IIIa	" "
Lowe, John C.	IIb	Methuen, "
McKone, Peter	VIa	Lowell, "
Muldoon, Joseph M.	VIIb	Lawrence, "
Murphy, Howard H.	VIa	Lowell, "
Orrell, Frank L.	IIb	" "
Palm, Carl H.	VIa	" "
Pihl, Ingrid I.	IIIb	" "
Preston, Harold L.	VIa	" "
Redman, Henry S.	VIa	" "
Riley, Edward T.	IIIa	North Billerica, "
Skidmore, Russell P.	VIIb	Lowell, "
Smith, Charles H.	VIa	Lawrence, "
Stevens, Harold S.	IIIa	Lowell, "
Sugden, Albert G.	IIIa	" "
Sullivan, Michael F.	VIa	Dracut, "
Taylor, Harold S.	VIIb	Lowell, "
Wade, John J.	VIa	" "
Wicks, Frederic M.	IIIa	Haverhill, "
Wilkinson, Joseph	IIIa	Lowell, "

Second Year

Allen, William J.	IVa	Lawrence, Mass.
Anderson, Gustaf	VIIb	Lowell, "
Anderton, Harry	IIIa	" "
Atkinson, Reginald C.	IVa	" "
Barrell, Wm. A.	I	Lawrence, "
Barrows, Ariston K.	IVa	Lowell, "
Batchelder, Horace J.	VIIb	Lawrence, "
Beaulieu, Wm. E.	IIb	Lowell, "
Beech, Wilfred	I	" "
Bell, Charles W.	VIa	" "
Bernard, Joseph E.	VId	" "
Blais, Emile	VId	" "
Bottomley, Edward P.	IIIa	" "
Brainerd, Albert C.	I	Lawrence, "
Brainerd, Harry C.	I	" "
Branson, Frank L.	IIIa	Lowell, "
Brown, Wm. F.	VIa	" "
Browne, Charles D.	I	" "
Carleton, Peter	VIa	" "
Chidlow, Alfred H.	VIa	Lawrence, "
Clark, John W.	IVa	" "
Coan, Charles B.	VIa	Ward Hill, "
Cochrane, Wm.	VIa	Lowell, "

Name	Course	Address
Cooke, Arthur	IVa	Lowell, Mass.
Copson, Wm. F., Jr.	IIIa	" "
Cote, Fred J.	VIa	Lawrence, "
Curtis, Arthur	VIa	Lowell, "
DeLong, Arthur E.	IIIa	" "
Dick, Henry K.	I	" "
Doole, John T.	IVa	" "
Downs, Patrick	VIa	" "
Dresser, Wm. H.	VIa	" "
Dulligan, Charles E.	IVa	" "
Dulligan, Thomas	VIa	" "
Dunn, George C.	IVb	" "
Egan, Charles H.	IVa	Boston, "
Elliot, Gordon B.	I	Lowell, "
Engstrom, Karl E.	VIa	" "
Enlind, Charles J.	VIa	" "
Finkel, Joseph W.	IVa	Lawrence, "
Flanagan, Leo F.	VIa	Lowell, "
Flanders, George A.	VIa	" "
Flemings Lester A.	IIIa	" "
Freeman, Ralph W.	IVa	" "
French, George W., Jr.	IIb	Lawrence, "
Frothingham, Newton S.	I	Lowell, "
Galloway, Herbert	IVa	Lawrence, "
Garrity, Joseph F.	VIa	Lowell, "
Geary, John W.	IVa	" "
Giffin, Charles H.	IIIa	" "
Giffin, George R.	IIIa	" "
Giffin, Wm. J.	IIIa	" "
Glennon, Edward M.	IVb	Lawrence, "
Gordon, Loyd H.	VIa	Lowell, "
Grantham, Charles V.	VIa	" "
Hanley, Edward T.	IIb	Forge Village, "
Hannagan, Edward F.	IIb	Lawrence, "
Hansen, Hans M.	VIa	Lowell, "
Hathaway, Leroy H.	IVa	North Chelmsford, "
Higgins, Alfred	IIIa	Methuen, "
Hill, Wm. L.	I	Lowell, "
Hinchliffe, Thomas P.	I	" "
Hodgson, Benjamin E.	IVa	Methuen, "
Hoelzel, Louis C.	VIa	Lawrence, "
Hood, Leslie N.	VIa	Nashua, N. H.
Jackson, Frank	VIa	Lawrence, Mass.
Judge, Martin	IIb	" "
Laforest, John	IIIb	Lowell, "
LaJeunesse, Joseph A.	IVc	" "
Lambert, Seth	IIb	Methuen, "
Lamont, Robert L.	I	Lowell, "
Laporte, Philip J.	IVa	" "
Leake, Edgar A.	IVa	Lawrence, "
Leaver, Raymond J.	VIb	" "
Leech, Joseph	VIb	Methuen, "
Leonard, Hugh	VIb	Lowell, "
Lewis, Charles S.	VIa	Lowell, "
Lhussier, Fred W.	IIb	North Chelmsford, "
Lockberg, John L.	VIa	Lowell, "
Maguire, James H.	IIb	" "

Name	Course	Address
Maguire, Philip J.	VIb	Lowell, Mass.
Mahoney, James A.	VIa	Lawrence, "
Manning, James B.	IVb	Lowell, "
Mayo, Fred R.	IVa	" "
McArthur, Osborn	IIIa	" "
Macdonald, Chester W.	VIa	" "
McDonald, Thomas F.	IIIa	North Billerica, "
McDonald, Wm. A.	VIb	Lowell, "
McGee, David	IVa	" "
McGowan, Annie C.	IIIb	" "
McNeilis, Robert E.	IIIa	" "
McOsker, James F.	VIa	" "
McOsker, John J.	VIa	" "
McQuade, John A.	VIId	" "
Metcalfe, Walter B.	IIb	North Chelmsford, "
Morin, Peter	IIIa	Lowell, "
Morley, Ernest C.	IIb	Lawrence, "
Morris, James	I	Lowell, "
Mountain, Everett R.	VIa	" "
Mullen, Francis J.	VIa	" "
Murray, Wm. H.	VIa	" "
Naylor, Charles	IVa	" "
Naylor, Fred	IIb	Forge Village, "
Needham, Frank G.	IIIa	Lowell, "
Nicoll, John	IVb	Andover, "
O'Malley, George M.	VIb	Lowell, "
Paasche, Henrik A.	IVa	" "
Paquette, Donat N.	IIIa	" "
Pihl, Ingrid I.	IIIb	" "
Rand, Sidney	VIb	Lawrence, "
Randall, Wm. O.	IIb	" "
Rochette, Joseph E.	IIIa	Lowell, "
Rodman, Frank C.	I	Boston, "
Rollins, Sidney R.	IIb	Lawrence, "
Royds, James	I	Lowell, "
Sargent, Charles E.	IIIa	" "
Savage, Charles F.	IVa	" "
Schofield, James	IIIa	" "
Scott, George W.	IIIa	" "
Scully, John F.	VIId	" "
Shaw, Albert	VIb	" "
Shaw, Stewart J.	VIa	" "
Shaw, Williams	VIa	" "
Shunny, John R.	VIb	" "
Skerrett, Walter J.	VIa	Methuen, "
Smith, Albert H.	IIIa	" "
Smith, James A. C.	IIIa	Lowell, "
Smith, Wm. F.	VIId	" "
Soule, Wm. N.	VIId	Lowell, "
Stevenson, Robert P.	I	" "
Swanson, Victor E.	IVa	" "
Talbot, Sarphiels J.	IIb	North Chelmsford, "
Tellier, Herman J.	VIId	Lowell, "
Towers, Frederic G.	I	Lawrence, "
Turgeon, Roderick	IVa	Lowell, "
Webster, Orrin H.	I	" "
Weeks, Harry F.	I	" "

Name	Course	Address
Whitman, Wm. P.	IVb	Lowell, Mass.
Wild, Thomas	VIb	" "
Winslow, Warren A.	IIb	Ayer, "
Younger, Andrew	IIIa	Lowell, "

First Year

Allard, Arthur A.	VIb	Lowell, Mass.
Alston, John R.	IVa	Lawrence, "
Anderson, Charles W.	VIa	Lowell, "
Andreoli, Richard J.	IVa	" "
Andrews, Charles T.	Va	South Lawrence, "
Apsit, John A.	VIa	Lowell, "
Armstrong, Robert J.	VIb	" "
Arnfield, Ethel V.	IIIb	" "
Arnold, Wm. W., Jr.	VIa	" "
Aspinall, George, Jr.	IVa	Lawrence, "
Atkinson, Norman	IIIa	Lowell, "
Axon, George	VIa	" "
Bachmann, Walter	IIIb	" "
Bagley, Edward R.	IIb	" "
Banks, Jonas	VIII	" "
Barnes, Joseph	VIa	Andover, "
Barnes, Wm.	VIa	" "
Barrell, Wm. A.	I	Lawrence, "
Bastow, Henry	VII	Lowell, "
Bastow, Percy	IVb	Methuen, "
Bateman, Samuel	IIb	" "
Baxter, George	Vb	Lawrence, "
Beattie, John T.	IIIa	" "
Beaulieu, Joseph D.	VIb	Lowell, "
Beech, Wilfred	VIII	" "
Best, Harry C.	I	" "
Bigelow, Prescott F.	I	" "
Biggs, Albert H.	VIa	" "
Bilodeau, Clifford P.	IIIa	Haverhill, "
Bixby, Joseph C.	VIa	Lowell, "
Bohnwagner, Max, Jr.	IIb	Lawrence, "
Boije, Walter F.	VII	Lowell, "
Boland, James J.	VIa	" "
Bombardier, Charles A.	IVa	" "
Bostwick, John W.	VIa	North Billerica, "
Bottomley, Ernest	IIb	Methuen, "
Boucher, Emile A.	IIIb	Lowell, "
Boucher, Fred H.	IIIa	" "
Bourdon, Wilfred J.	VIa	" "
Bouthillette, Jean	VIa	" "
Bramley, Charles	Va	Methuen, "
Breckenridge, Robert	IIIb	Lowell, "
Breen, James D.	IIIa	" "
Breglia, Cesare	VIa	Lawrence, "
Brien, Arthur	VIa	Lowell, "
Brien, Joseph	VIa	" "
Briere, Andrew	VIa	" "
Broderick, Thomas H.	VII	North Andover, "
Brown, James H.	VIa	Forge Village, "

Name	Course	Address
Brown, Leon E.	VIa	Lowell, Mass.
Brown, Rollins	IIb	" "
Bruce, Alexander	IIIa	Lawrence, "
Bryan, Levi A.	VIb	Andover, "
Bryant, Fred J.	VIa	Lawrence, "
Bryant, Harold A.	IIb	" "
Burke, George J.	VII	Dracut, "
Burns, Edward K.	IVa	Lowell, "
Cahill, Thomas P.	VIb	" "
Campbell, Edward G.	IIIb	" "
Campbell, James F.	VIa	North Andover, "
Campling, Frank	IIb	Methuen, "
Cannon, Ed L.	IIIa	Boston, "
Carlson, Frank W.	VIb	Lowell, "
Carlson, Goddard O.	VII	" "
Carlson, Herbert W.	VIa	West Chelmsford, "
Carr, Wm. T.	VIa	Lowell, "
Cassidy, John J.	IIIa	" "
Cayten, John G.	I	" "
Chadwick, Walter	VIa	" "
Champion, Francis L.	IVa	North Andover, "
Chaplain, Frank	VIa	Lowell, "
Chevalier, Edward J.	IIIb	" "
Clancy, Nellie A.	IIIa	Nashua, N. H.
Clarke, Wesley J.	VIb	Ballardvale, Mass.
Clough, Henry P.	VIa	Lowell, "
Cochrane, Wm.	VIa	" "
Coffin, Arthur R.	VIa	" "
Coleman, Frank A.	I	Lawrence, "
Collins, Frank	VIa	Forge Village, "
Collins, Frank J.	VIa	Lowell, "
Collipi, Angelo A.	IIIa	Collinsville, "
Conant, Richard G.	IIb	Lowell, "
Conley, Bernard C.	IVa	" "
Conley, Leander F., Jr.	VIa	" "
Cook, Alfred C.	VIb	" "
Cosgrove, James	VIa	" "
Cote, George W.	VIa	" "
Cote, Harry F.	VIa	" "
Coupe, James T.	IVa	" "
Coutu, Albert J.	IIIa	" "
Cowgill, Annie	IIIa	" "
Cox, Alfred	Va	" "
Cox, Christopher J.	VIa	" "
Cox, Edward J.	I	" "
Cox, John J.	I-VIa	" "
Cronshaw, Wm.	VIa	" "
Cudmore, Edward T.	VIb	" "
Cullinan, Wm. H.	IIIa	Collinsville, "
Culver, John H.	IVe	Lowell, "
Curtis, Arthur	VIa	" "
Cushing, Lester H.	I	" "
Cutress, Albert J.	VIa	" "
Daly, Carroll G. C.	I	" "
Darlington, Fred	IIb	Methuen, "
Daskalakis, Euthimios	Vb	Lowell, "

Name	Course	Address
Davieau, Arthur N.	I	Lowell, Mass.
Davis, Edward B.	VI d	Ballardvale, "
Degnan, James H.	II b	Lawrence, "
Delderfield, John W.	VI a	Lowell, "
Delderfield, Wm.	V a	" "
Dennison, Fred	I	Methuen, "
Devine, Mary F.	IV a	Lowell, "
Devno, George A.	VI a	" "
Dickey, Nelson P.	VI a	" "
Dillon, Henry D.	I	" "
Dixon, Wm.	II b	Methuen, "
Doherty, Robert	VI a	Lowell, "
Dolan, Russell P.	IV a	Lawrence, "
Donahey, Wm. H.	V b	Lowell, "
Doole, James E.	IV a	" "
Dowd, Martin F.	III a	Lawrence, "
Downing, Esther M.	IV a	Lowell, "
Doyle, John B.	VI d	" "
Dulligan, Charles E.	IV c	" "
Dumais, Moise	VI d	" "
Early, Wm. E.	VI b-d	" "
Eastwood, Herbert W.	II b	Methuen, "
Elliot, Gordon B.	I	Lowell, "
Elliot, Henry S.	VI a	" "
Ellis, Charles D.	V b	" "
Ellis, Rhona F.	III b	" "
Erickson, Arthur W.	VI d	" "
Estabrook, Albert E.	I	" "
Farrell, Albert E.	V b	" "
Feindel, Catherine E.	III b	Chelmsford, "
Fenlason, Harris, Jr.	VI a	Lowell, "
Fernald, Hiram T.	VI a	" "
Finkel, Joseph W.	IV b	Lawrence, "
Finlay, Harry F.	IV e	" "
Fischer, Oswald P.	III a	" "
Flynn, James M.	II b	Lowell, "
Forbes, Arthur	VI b	" "
Forrest, Wm. R.	VI d	" "
Forster, Walter H.	IV a	" "
Foster, James A.	V b	" "
Fox, Maurice A.	II b	Lawrence, "
Frank, Emil M.	II b	" "
Freeman, George D.	VI d	Lowell, "
Freeman, Ralph W.	IV b	" "
Frenette, Henry F., Jr.	VI b	" "
Frohberg, Johannes	III a	Winthrop, "
Gadsby, Arthur N.	VI b	Lowell, "
Garrity, Peter F.	VI a	" "
Gauthier, Wm.	III a	" "
Gibbons, James J.	VI a	Lawrence, "
Gile, Harold E.	IV a	" "
Gill, John T.	I	Lowell, "
Gill, Leonard	II b	Lawrence, "
Giroux, Romuald D.	VI a	Lowell, "
Glenzel, Edward	III a	Methuen, "
Goeme, Arthur	V c	Lowell, "
Goldrick, Edward J.	III a	" "

Name	Course	Address
Gookin, Alice L.	IVa	Lowell, Mass.
Gordon, Edwin C.	VIa-d	North Chelmsford, "
Gould, Fernald N.	VIa	Lowell, "
Graham, John R.	VI d	" "
Green, Francis C.	VIa	" "
Greenwood, Ralph F.	VII	Lawrence, "
Greer, Robert	IIb	Lowell, "
Gregoire, Henry J.	VIII	" "
Grugan, Marvin	VIa	" "
Guiney, John P.	VIa	" "
Guiney, Joseph W.	VIIb	" "
Gunter, Wm.	VIa	Lawrence, "
Hackett, Edward	IIIb	Lowell, "
Hall, Robert A.	I-IIIa	" "
Halloran, Bertha	VIa	" "
Halloran, Joseph M.	VIa	" "
Hallowood, Edward M.	VII	" "
Hamel, Albert X.	VIa	" "
Hamilton, Wm. J.	I	" "
Hanley, Charles I.	IIb	Lawrence, "
Hanley, Wm.	IIIa	" "
Hanslip, Charles W.	IIIa	Lowell, "
Hanson, Edward	I	" "
Harnden, Edward	IIb	" "
Harrall, Wm.	VI d	" "
Harrison, Glenn A.	I	" "
Hart, Henry T.	IVa	Lawrence, "
Hartshorn, George T.	I-IVa-VII	Lowell, "
Hartwell, Marcus H.	IIIa-Vb-c	" "
Hathaway, Henry B.	IIIb	" "
Hathaway, Leroy H.	IVb	North Chelmsford, "
Healey, Alfred J.	VIIb	Lowell, "
Heery, Thomas C.	VIIb	" "
Henzie, John J.	IIIa	" "
Herron, Alexander T.	I	" "
Hibbert, George E.	Vb-c	" "
Higginbottom, Joseph J.	VIa	" "
Higgins, Wm. P.	VIa	" "
Higginson, Frederic, Jr.	IIIa	Lawrence, "
Hill, Bruce	IIIa	Methuen, "
Hill, Ellsworth O. C.	IIIa	Lawrence, "
Hill, Henry	IIb	North Andover, "
Hill, Sidney C.	IIIa	Lowell, "
Hiltz, Thomas H.	VIa	" "
Hird, Guy E.	VIa	" "
Hodge, Wm.	IIb	Andover, "
Hoffman, Henry W.	IIIa	Lawrence, "
Horman, Charles P.	IIIa	Lowell, "
Hornby, Wm. A.	IIIb	" "
Howard, Herbert J.	VIa	" "
Howe, Charles W., Jr.	VIa	" "
Howker, John	I	" "
Hoyle, Thomas	IIb	" "
Humphriss, George C.	IIb	" "
Hutchings, James C.	VII	Lawrence, "
Hutton, Vincent T.	IIIa	Lowell, "

Name	Course	Address
Inch, Thomas S.	IIIa	Collinsville, Mass.
Ingham, Herbert	IIb	Lowell, "
Inglis, Thomas F.	VIa	" "
Jackson, Charles F.	VIb	North Andover, "
Jackson, George T.	VIa	" "
Jackson, Walter J.	IIb-IIIa	Lawrence, "
Jarvis, Charles	VIb	Andover, "
Jasper, Grant	Vc	Lowell, "
Jepson, Isaiah	Va	" "
Jodoin, Francis	IIIb	" "
Johnson, Carll O.	I	" "
Johnson, Robie S.	VIII	" "
Jones, Herbert	I	" "
Jones, Leo J.	VI d	" "
Jordan, Wm. J.	Vb	" "
Kelley, Henry P.	VI d	" "
Kelley, Joseph P.	VIa	" "
Kelman, Walter S.	VIa	" "
Kennedy, Edgar	VIa	" "
Kenney, Wm. M.	IIIa	" "
Kenny, John F.	VIa	" "
Kiernan, James J.	IVa	Collinsville, "
Kirkpatrick, Harold B.	I	Lowell, "
Kivlan, John H.	IIIa	" "
Labrecque, Andrew M.	VIa	" "
Labrecque, Joseph M. M.	VIa	" "
Lahiff, Francis L.	VIb	" "
Lamont, Robert L.	I	" "
Lane, Ralph J.	VIb	" "
Langevin, George F.	VIb	" "
Lariviere, Josephat	IIIa	" "
Leary, Charles J.	IVa	" "
Leaver, Harold E.	IIb	Lawrence, "
Lebeaker, Samuel	IIa	Lowell, "
Leech, Joseph	VIa	Methuen, "
Leith, Joseph E.	IIIa-Vb	Lowell, "
Lemay, George E.	VIII	" "
Lewis, George E., Jr.	IIIa	Lawrence, "
Liddell, Russell C.	VIa	Lawrence, "
Lillis, Marvin H.	VIb	" "
Linberg, Joseph F.	IVb	Lowell, "
Linehan, Jeremiah A.	VIa	North Billerica, "
Longbottom, Charles	VII	Lawrence, "
Lorenz, Walter	IIIa	Methuen, "
Loud, Morton V.	VIa	Lowell, "
Louney, Timothy J.	VIa	" "
Mack, Clarence P.	IIIa	Lawrence, "
Mackenzie, Raymond	VIb	Lowell, "
Maguire, James H.	IIb	" "
Maguire, Philip J.	VIa	" "
Mahoney, Arthur L.	VII	North Billerica, "
Marden, Stanley A.	IIb	North Chelmsford, "
Marsden, Phillips B.	IVb	Lawrence, "
Marten, Charles	VIa	Lowell, "
Mason, Wm. D.	I	" "
Mayhew, Pauline I.	IIIb	" "

Name	Course	Address
McCann, Martin	Vb	Lowell, Mass.
McCarty, Charles	VIa	" "
McComb, Albert J.	VIId	North Chelmsford, "
McDermott, Catherine E.	IIIb	Lowell, "
McDougal, Albert	VIIb	" "
McElroy, Samuel H.	IIIa	" "
McGaunn, Charles	VIIb	" "
McGrath, Walter F.	VII	" "
McGurn, James	VIId	" "
McIntire, Everett L.	VIa-b	" "
MacKenney, Harold E.	IIIb	" "
McKnight, Wm. H.	VIIb	" "
MacLaughlan, Arthur R.	VIIb	" "
McLaughlin, Daniel	Vb	" "
McLaughlin, James P.	VIa	" "
McLaughlin, John	Vb	" "
McLean, Wm. G.	VIa	" "
McQuade, Wm. J.	VIIb	" "
MacVey, Paul K.	IVa	" "
Meehan, Wm. F.	VIa	" "
Michael, Joseph C.	Vb	" "
Miller, Grant L.	I	" "
Milot, Joseph E.	VIa	" "
Mitchell, Thomas E.	VIa	" "
Mitchell, Wm.	IIb	" "
Mitropulos, Demetrios A.	Vb	" "
Monahan, Patrick H.	VIId	" "
Moreira, Peter F.	VIa	" "
Morgan, Arthur	Vb	" "
Morgan, David C.	VIIb	Lawrence, "
Morin, Joseph A.	VIa	Lowell, "
Morris, Raymond	IVa	North Billerica, "
Morrison, Wm. S.	VIa	Lowell, "
Mosley, Herbert	IIb	Lawrence, "
Mott, Leroy W.	VIIb	Ballardvale, "
Mottram, Frederic A.	VIa	Lowell, "
Mowatt, John	VIa	" "
Muldoon, Joseph M.	VIa	Lawrence, "
Mullarkey, Edward J.	VIa	Lowell, "
Mullen, John F.	IVa	" "
Murphy, Charles A.	VIId	Andover, "
Murphy, Francis T.	VIIb	Lowell, "
Murphy, Howard H.	IIIb	" "
Murphy, James E.	Va	North Andover, "
Murphy, Joseph M.	IVa	Lawrence, "
Murphy, Michael W.	VIa	Lowell, "
Murray, Paul W.	VIIb	" "
Myrick, Adam W.	VIa	" "
Nelson, Charles J.	VIa	Collinsville, "
Nichol, Samuel J.	IVb	Lowell, "
Nichols, Nathan A.	VIa	" "
Normandy, Joseph M.	VIId	" "
Noyes, Frank J.	VIa	" "
O'Brien, Joseph P.	IVa	" "
O'Brien, Robert	VIa	" "
Obst, Ehrich	VIa	Methuen, "

Name	Course	Address
O'Connell, Edward	I	Lowell, Mass.
O'Donnell, Hugh	VIb	South Lawrence, "
O'Donnell, Thomas	VIa	Lowell, "
O'Hagan, Christopher	VIb	" "
O'Neil, Leo E.	VIa	" "
Orrell, Ernest R.	VIId	" "
Paasche, Henrik A.	IVa	" "
Paquin, Alfred L.	VIa-b	" "
Parent, Louis J.	VIa	" "
Pearson, Ragnar	VIa	" "
Perron, Francis J.	Vc	North Andover, "
Peterson, Ernest S.	VIa	Lowell, "
Pfefferhorn, Harold P.	I	Lawrence, "
Phelps, John L.	VIb	Lowell, "
Pinkham, Banford O.	VIa	Haverhill, "
Poore, Leon C.	IVa	Lowell, "
Pottinger, James G.	I	" "
Preble, George A.	Va	" "
Prescott, Wm. B.	IIIa-Va	" "
Prince, Mary K.	IIIb	" "
Quinn, Daniel C.	IVa	" "
Quinn, John H.	VIId	" "
Raine, George E.	VIa	" "
Ramsay, Arthur D.	I	" "
Rauscher, Raymond F.	IIb	Lawrence, "
Rice, Thomas G.	IIIa	Lowell, "
Richards, Raymond	IIIb	" "
Richardson, Leroy	IIIb	" "
Richburg, Clyde W.	IIIb	" "
Riley, Edward T.	VII	North Billerica, "
Riley, Thomas J.	VIa	" "
Riordan, Julia B.	IVa	Lowell, "
Robillard, Rosario	Va	" "
Robinson, Percy T.	IIb	" "
Rochette, Joseph A.	IIIa	" "
Rodman, Frank C.	I	Boston, "
Roesler, Alfred	IIIa	Lawrence, "
Rogers, Earle A.	I	Lowell, "
Rogers, John F.	IIIa	" "
Rolfe, Fred, Jr.	VIb	" "
Rollins, Henry E.	VII	Lawrence, "
Rooney, Hugh M.	IVa	Lowell, "
Ross, Ernest E.	IVa-VIb	Stoneham, "
Rouine, Francis E.	VIb	Lowell, "
Rowe, George A.	VIa	" "
Ruiter, Claude	VIId	" "
Ryan, George A.	VIa	" "
Sabourin, David E.	VIa	" "
St. Cyr, Henry	VIa	" "
St. Laurent, George	VIb	Lawrence, "
Salome, Joseph R.	I	Lowell, "
Savage, Emmons L.	VIb	" "
Schnell, Joseph T.	VIII	" "
Scott, James W.	VIa	" "
Seifert, Edgar F. K.	IVa	Lawrence, "
Seymour, Louis	VIb	Lowell, "

Name	Course	Address
Shaffer, Wm. A.	VIa	Lowell, Mass.
Shea, James T.	VIb	" "
Shea, Patrick J.	I	" "
Shearer, David D.	VII	Lawrence, "
Sheehan, Charles A.	VIb	Lowell, "
Sherman, Charles R.	VIa	Tewksbury Center, "
Sherwin, Fred H.	VIa	Nashua, N. H.
Shields, John J.	Va	Lowell, Mass.
Shore, Joseph A.	IVa	" "
Sidebottom, Leon W.	IVe	Lawrence, "
Simpson, Edwin P.	VIa	North Billerica, "
Skidmore, Russell P.	VIa	Lowell, "
Slattery, Thomas F.	VIa	" "
Smith, Charles H.	VIa	Lawrence, "
Smith, Hartman F.	IIb	" "
Smith, Howard	IIa-IIIa	" "
Smith, John	I	Lowell, "
Smith, Joseph	Va	" "
Smith, Leonard	VIa	Methuen, "
Sousa, Andrew P.	VIa	Lowell, "
Spaulding, David E.	VIb	" "
Speight, Reuben	VIb	Methuen, "
Standish, John C.	I	Lowell, "
Stevenson, Robert P.	I	" "
Stewart, George	VIa	" "
Stickney, Walter E.	VIb	Ballardvale, "
Stott, Bertram S.	IIIa	Andover, "
Stultz, Frank A., Jr.	IIIa	Haverhill, "
Sugden, Albert G.	VII	Lowell, "
Sullivan, Thomas L.	IIa	" "
Sweeney, Wm.	VIa	" "
Symonds, Willard E.	IVa	" "
Taff, Joseph	VIa	" "
Taylor, Wallace	IVa	Lawrence, "
Teague, Thomas L.	IVa	Lowell, "
Tellier, Azellus E.	IIIb	" "
Therriault, Arthur J.	I	" "
Thibault, Hervy L.	IIIa	" "
Thompson, Leonard A.	VIa-b	" "
Thurber, Alexander H.	VIa	" "
Tighe, George F.	VIa	" "
Towler, Wm.	IIIa	Lawrence, "
Towne, Raymond A.	VIa-b	North Andover, "
Trainor, John J.	VIa	Lowell, "
Tucker, Walter E.	Va	" "
Turner, Annie P.	IIIb	" "
Turner, Florence E.	IIIb	" "
Vause, John	Va	Lawrence, "
Verfaillie, Alfred	VIb	" "
Vickerman, Warren P.	IIb	Lowell, "
Vigeant, Napoleon J.	IIIb	" "
Wade, John J.	VIa	" "
Wagner, Gustave A.	IVa	Lawrence, "
Wainwright, Harold	IVa	" "
Walworth, George W.	I	Lowell, "
Walworth, Walter F.	VIb	" "

Name	Course	Address
Ward, Bernard D.	I	Lowell, Mass.
Ward, Herbert H.	Vb	" "
Ward, Wm. H.	IIa-IIIa	" "
Weeks, Harry F.	I	" "
Weigel, Frederick A.	VIa	Lawrence, "
Welch, Edwin F.	IIb	Dracut, "
Welch, John	VIb	Lawrence, "
Wibberly, Wm.	I	Lowell, "
Wiessner, Albert H.	IIIa	Lawrence, "
Wikstrom, James E.	VIa	Lowell, "
Wilkinson, Harry	IIIa	Methuen, "
Williams, Allen R.	IIIa	Lowell, "
Wilson, Percy	VIa	Forge Village, "
Winsor, Edward A.	IIIa-Vb	Lowell, "
Wirt, Edward R.	I	" "
Wood, Arthur S.	Va	" "
Wood, Wm. H.	VIb	" "
Worrall, Robert H.	VIa	" "
Wright, Frederick J.	Vb	" "
Yates, Robert, Jr.	IIIa	" "
Young, Richard, Jr.	IIIa	" "

SUMMARY

Day Students	169
Evening Students	660
Total	829
Names counted twice	59
Net Total	770

ALPHABETICAL REGISTER OF GRADUATES

Name	Course	Class	Day or Evening
Abbott, Edward M.	II	1904	D
Abbott, George R.	II	1908	D
Abbott, Paul W.	I	1906	E
Ackroyd, Theodore C.	IIb	1907	E
Adams, Henry S.	IIa	1903	E
Adams, Henry S.	I	1905	D
Adams, Michael E.	VI	1904	E
Adams, Tracy A.	IV	1911	D
Adams, William R.	IIa	1902	E
Amiot, Louis H.	Va	1906	E
Anderson, Carl A.	IV	1909	E
Anderton, Harry	Va	1910	E
Andrews, Oliver	I-Va	1911	E
Arienti, Peter J.	IV	1910	D
Armstrong, Elias B.	IIb	1906	E
Arnold, Warren H.	VII	1908	E
Arnold, Warren H.	IIIa	1909	E
Arundale, Henry B.	II-III-V	1905	D
Arundale, Henry B.	II	1907	D
Aspinwall, William	IIb	1901	E
Atkinson, Norman	Vb	1910	E
Avery, Charles H.	II	1906	D
Bailey, Carl E.	I	1910	E
Bailey, Joseph W.	I	1899	D
Bailey, Rothwell	Va	1909	E
Bailey, Walter J.	IV	1911	D
Bain, William A.	VII	1907	E
Bake, Herbert	IIIa	1905	E
Bake, Herbert	P. G. IIIa	1906	E
Bake, Herbert	VII	1907	E
Bake, Herbert	P. G. IIIa	1909	E
Baldwin, Arthur L.	IV	1900	D
Baldwin, Frederick A.	II	1904	D
Ballard, Horace W. C. S.	IV	1908	D
Ballinger, Frederick W.	IIb	1907	E
Ballinger, William E.	IIb	1911	E
Balmforth, James H.	IIa	1903	E
Balmforth, James H.	IIa-b	1904	E
Balmforth, William F.	VI	1904	E
Balmforth, Martha B. (See French)			
Banks, Jonas	Va	1909	E
Banks, Jonas	Vc	1910	E
Barber, James E.	IIb	1907	E
Barker, John P.	V	1904	E
Barlow, Robert	V	1902	E
Barnes, Joseph	I	1911	E
Barr, Elizabeth Butler	III	1909	E
Barr, I. Walwin	I	1900	D
Barraclough, John C.	I	1907	D
Barrington, James L.	IV	1908	E
Barrington, John A.	IV	1904	E
Barry, Edward J.	IIIa	1903	E
Bastow, Henry	IIIa	1903	E
Bastow, Henry	V	1905	E

Name	Course	Class	Day or Evening
Bastow, Percy	IVa	1911	E
Bastow, Stephen W.	IV	1907	E
Baxter, Alvah J.	IIa	1903	E
Bayard, Pierre P.	IIIa	1907	E
Begen, Thomas W.	IIb	1907	E
Begen, Thomas W.	IIb	1908	E
Bell, Frederick W.	IIa	1905	E
Bennett, Edward H.	V	1903	D
Benoit, Benjamin L.	VIb	1909	E
Benoit, William A.	Va	1907	E
Berry, Alfred H.	VI	1908	E
*Berry, Frank M.	IIIa	1899	E
*Berry, Frank M.	V	1901	E
Berry, Percy W.	Vb	1910	E
Binns, Heaton	II-V	1899	E
Binns, Heaton	VI	1902	E
Birkby, Charles H.	IVa	1911	E
Blaikie, Howard M.	II	1911	D
Bloom, Wilfred N.	IV	1903	D
Bodwell, Henry A.	II	1900	D
Booth, Arthur	IIIa	1909	E
Boucher, John L.	VI	1904	E
Bouille, Arthur L.	Vb	1907	E
Bourchard, Ethan J.	Vc	1910	E
Bourchard, Robert R.	Vb	1910	E
Bowen, Herbert E.	IIIa	1909	E
Bowie, Samuel A.	VI	1905	E
Bowring, George P. B.	VI	1902	E
Boyd, George A.	I	1905	D
Bradford, Roy H.	II	1906	D
Bradley, Richard H.	V	1901	D
Brainerd, Arthur T.	IV	1909	D
Brainerd, Irving L.	I	1902	E
Brannen, Leon V.	III-V	1907	D
Brannen, Leon V.	IIa	1907	E
Brickett, Chauncey J.	II	1900	D
Broadbent, James H.	Vb	1908	E
Broadbent, James T.	I	1899	E
Broadbent, William	Vb	1908	E
Brooks, Noah	IIIa-V	1901	E
Brouder, John J.	IIIa	1906	E
Brouder, John J.	VII	1907	E
Brown, James P.	IIIa	1905	E
Brown, James P.	P. G. IIIa	1906	E
Brown, James T.	IIIa	1908	E
Brown, William F.	VIb	1911	E
Brown, William G.	IIb	1906	E
Bryant, Ernest L.	VI	1905	E
Buchan, Donald C.	II	1901	D
Buckley, Harry	IV	1908	E
Buckley, Richard A.	Vb	1909	E
Bucklitsch, Gustave J.	IIb	1907	E
Bunce, Raymond H.	Vb	1909	E
Burgess, Joseph H.	Va	1906	E

*Deceased

Name	Course	Class	Day or Evening
Burgess, Joseph H.	Vb	1907	E
Burgess, Joseph H.	IIIa	1910	E
Burghardt, Edward S.	IIa	1902	E
Burghardt, Paul C.	IIa	1901	E
Burke, James F.	Vc	1911	E
Burke, Thomas F.	I	1905	E
Burnham, Frank E.	IV	1902	D
Burnham, Joseph W.	IIIa	1906	E
Burnham, Wilmont V.	Vb	1906	E
Burns, Edward J.	IV	1905	E
Burns, James E.	IV	1905	E
Burrage, Katherine C.	IIIb	1899	D
Burrage, Katherine C.	P. G. IIIb	1900	D
Butler, Benjamin O.	VI	1904	E
Butler, Elizabeth M. (See Barr)			
Butterworth, Charles A.	Va	1907	E
Butterworth, John A.	IIb	1907	E
Buzzell, William O.	IIIa	1901	E
Buzzell, William O.	P. G. IIIa	1902	E
Byam, Walter S.	VI	1903	E
Cady, Dennis J.	V	1903	E
Callahan, Patrick A.	VI	1904	E
Cameron, Elliott F.	IV	1911	D
Campbell, Albert D.	IIb	1900	E
Campbell, Archibald	IV	1908	E
Campbell, Edward G.	VIc	1910	E
Campbell, Laura E.	IIIb	1900	D
Campbell, Louise P.	IIIb	1903	D
Campbell, Orison S.	II	1903	D
Carden, Francis E.	IIb	1907	E
Carden, Francis E.	IIb	1908	E
Carlson, Ernest B.	IIb	1907	E
Carman, William	Va	1909	E
Carney, William J.	I	1908	E
Caron, Cleophas	I	1905	E
Carpilio, John A.	VIa	1911	E
Carr, George E.	I	1905	D
Carter, Charles R.	Vb	1908	E
Carter, Robert A.	IV	1902	D
Carty, Thomas P.	Vb	1911	E
Cary, Julian C.	VI	1910	D
Cawthra, Albert B.	IIb	1900	E
Chamberlin, Frederick E.	I	1903	D
Chandler, Proctor R.	IV	1911	D
Cheetham, John James	IIIa	1901	E
Cheetham, John James	P. G. IIIa	1902	E
Cheetham, John Joseph	I	1904	E
Chesworth, Frank K.	Va	1909	E
Chippindale, Ernest W.	IIb	1901	E
Chisholm, Lester B.	I	1911	D
Christison, Hugh	IV	1910	E
Christison, Hugh	IVd	1911	E
Church, Charles R.	II-V	1906	D
Churchill, Charles W.	III	1906	D
Clapp, F. Austin	II	1904	D
Clark, Thomas T.	II	1910	D

Name	Course	Class	Day or Evening
Clogston, Raymond B.	IV	1904	D
Cochrane, John	VIb	1911	E
Cockell, Frederick H.	IIIa	1909	E
Colby, Arthur D.	I	1900	E
Cole, Edward E.	IV	1906	D
Cole, James T.	II	1905	D
Collier, John	IIIa	1899	E
Collier, John	P. G. IIIa	1902	E
Collins, John A.	IIa-b	1905	E
Coman, James G.	I	1907	D
Conant, Harold W.	I	1909	D
Conklin, Jennie G.	IIIb	1905	D
Conley, Frederick A.	VI	1904	E
Connors, Edward F.	VI	1904	E
Cook, Cheney E.	IIIa	1905	E
Corr, Eben W.	Vb	1908	E
Corr, James F.	Vb	1908	E
Cote, George W.	VIb	1911	E
Cowdell, Herbert	V	1901	E
Cowdrey, Charles E.	V	1902	E
Cowdrey, Charles E.	Vb	1909	E
Cox, Edward J.	IIIa	1910	E
Cox, Edward J.	Va	1911	E
Craig, Albert W.	IV	1907	D
Craig, Clarence E.	III	1902	D
Craven, Harry	VII	1908	E
Cremin, Daniel J.	I	1902	E
Crompton, Henry H.	II	1899	E
Culver, Ralph F.	IV	1904	D
Curran, Charles E.	II-III-V	1902	D
Currier, Herbert A.	I	1906	D
Currier, John A.	II	1901	D
Curtis, Frank M.	I	1906	D
Curtis, William L.	II	1905	D
Custer, James J. E.	V	1905	E
Cutler, Benjamin W., Jr.	III	1904	D
Cutress, Albert J.	VIa	1910	E
Cuttle, James H.	II	1899	D
Dana, Clarence A.	VI	1905	E
*Davis, Henry	IIb	1901	E
Davis, Prentice T.	I	1904	E
Davison, Frank L.	Vb	1909	E
Dean, Hubert R.	VIb	1911	E
Deely, John A.	Vb	1910	E
Delaney, Michael J.	Vb	1911	E
Delmage, Edward R.	IIIa	1904	E
Dempsey, John W.	IIa	1904	E
Dewey, James F.	II	1904	D
Dewey, Maurice W.	II	1911	D
Dick, Hugo P.	IIIa	1905	E
Dick, Hugo P.	P. G. IIIa	1906	E
Dick, Hugo P.	IIb	1907	E
Dick, Hugo P.	Vb	1908	E
Dickson, Andrew	IIa	1906	E
Dillon, James H.	III	1905	D

*Deceased

Name	Course	Class	Day or Evening
Dimlick, Benjamin C.	IIIa	1905	E
Dimlick, Benjamin C.	P. G. IIIa	1906	E
Dixon, Arthur	IIIa	1908	E
Dobbs, William	IIb	1907	E
Dobbs, William	IIb	1908	E
Dodge, Charles P.	IIa	1907	E
Dodge, Ernest W.	Vb	1911	E
Dodge, Frank	I	1906	E
Donahue, Michael F.	VI	1904	E
Donald, Albert E.	II	1904	D
Donnellan, Frank T.	IIa	1902	E
Donnellan, Frank T.	V	1903	E
Donnelly, James	I	1900	E
Donovan, Daniel F.	IIa	1901	E
Doole, George L.	VI	1904	E
Dooley, Edward W.	VI	1904	E
Downs, John F.	VId	1911	E
Duce, Benjamin	IIIa	1906	E
Duce, Benjamin	VII	1907	E
Duckett, Fred I.	Vb	1910	E
Dudley, George E.	I	1902	E
Duggan, Francis P.	VI	1904	E
Dulligan, Charles E.	VIa	1909	E
Dulligan, Lawrence F.	VIa	1910	E
Dulligan, Thomas	VIa	1911	E
Dunn, George C.	IIIa	1908	E
Dunn, George C.	IVa	1910	E
Dunning, Carlos W.	VIIb	1909	E
Duval, Joseph E.	II	1910	D
Dwight, John F., Jr.	II	1908	D
Ehrenfried, Jacob B.	II-V	1907	D
Eklund, Louis V.	Vb	1910	E
Ellis, George W.	VII	1906	E
Elston, Fred R.	IIIa	1900	E
Emerson, Frank W.	II	1903	D
Erbe, Gustave	VI	1905	E
Evans, Alfred W.	III	1903	D
Evans, William R.	III	1903	D
Evison, William A.	V	1901	E
Ewer, Nathaniel T.	IV	1901	D
Eyers, John T.	IV	1906	E
Fairbanks, Almonte H.	II	1909	D
Farmer, Chester J.	IV	1907	D
Farr, Leonard S.	II	1908	D
Farrell, Thomas	IIa	1901	E
Fels, August B.	II	1899	D
Ferguson, Arthur F.	I	1902	D
Ferguson, Arthur F.	I	1903	D
Ferguson, Thomas	V	1902	E
Ferguson, William G.	III	1909	D
Field, Charles W.	VI	1902	E
Fielding, Fred	Vc	1910	E
Finlay, Harry F.	IV	1910	D
Fiske, Starr H.	II	1909	D
Flaherty, William	Vb	1911	E
Fleming, Frank E.	IV	1906	D

Name	Course	Class	Day or Evening
Flemings, Lester A.	Va	1910	E
Fletcher, Roland H.	VI	1910	D
Flint, Leon G.	IIIa	1907	E
Flynn, John	VIId	1910	E
Flynn, John J.	VI	1903	E
Flynn, Patrick	Vb	1910	E
Flynn, Thomas P.	IV	1911	D
Flynn, William J.	Vb	1908	E
Ford, Edgar R.	IV	1911	D
Forrest, Fred G.	IIa	1902	E
Fortune, David A.	IIb	1902	E
Foster, Clifford E.	II	1901	D
Foster, Sherwood L.	I	1905	E
Fournier, Albert A.	I	1911	E
Frame, William	V	1901	E
Frank, Emil M.	IIIa	1904	E
Frank, Emil M.	P. G. IIIa	1906	E
Frechette, Alphonse J.	IIb	1907	E
French, Ernest J.	I	1905	E
French, Martha Balmforth	IIIa	1903	E
Fujiyoshi, Heisayu	I	1910	E
Fujiyoshi, Heisayu	Va	1911	E
Fuller, George	I	1903	D
Fuller, John M.	V	1906	E
Gagan, John H.	V	1901	E
Gahm, George L.	II	1906	D
Gainey, Francis W.	IV	1911	D
Gakidis, Alexander N.	IVa	1911	E
Gale, Harry L.	III	1910	D
Garner, William	IIIa	1903	E
Garrity, Joseph F.	VIId	1911	E
Gaspar, Edith E.	IIIb	1910	E
Gaunt, Alfred C.	IIIa	1899	E
Gaunt, Alfred C.	P. G. IIIa	1902	E
Gaunt, Alfred C.	IIa	1903	E
Gaunt, Alfred C.	IIb	1904	E
Gaunt, Ernest H.	IIIa	1909	E
Gauthier, William	Vb	1910	E
Gay, Earle B.	I	1905	E
Gay, Olin D.	II	1908	D
Gerrish, Walter	III	1903	D
Gilinson, Philip J.	VIa	1909	E
Gillispie, James E.	VII	1907	E
Gillon, Sarah A.	IIIb	1906	D
Glennon, Edward M.	IVa	1911	E
Goldberg, George	VI	1910	D
Good, Henry	I	1902	E
Goodchild, George	I	1903	E
Goodchild, George	VI	1905	E
Goodhue, Amy H. (See Harrison)			
Goodwin, Ross	Vb	1911	E
Gookin, Alice L.	IIIb	1910	E
Gordon, Herbert E.	IIIa	1909	E
Grant, Archibald	IIb	1901	E
Gray, Finley M.	VI	1903	E
Greenhalge, James	Vc	1908	E

Name	Course	Class	Day or Evening
Gregson, Robert B.	Va	1906	E
Gregson, Robert B.	I-Vc	1907	E
Gourke, Michael	IIb	1901	E
Gustafson, Alfred L.	IVa	1911	E
Gyzander, Arne K.	IV	1909	D
Haartz, John C.	VII	1907	E
Haas, Ignatius	I	1907	E
Hadley, Walter E.	IV	1908	D
Haigh, Walter	IIIa	1902	E
Haigh, William	Vb	1906	E
Hallbauer, William R.	Vb	1908	E
Halsell, Elam R.	I-V	1904	D
Hamblett, Harry A.	I	1907	E
Handley, John M.	Vb	1911	E
Hanglin, Albert J.	IV	1907	E
Hanglin, William E.	Vb	1907	E
Hanslip, Charles W.	Vb	1911	E
Hanson, Edward	IIIa	1908	E
Hanson, Edward	P. G. IIIa	1909	E
Harder, Elmer E.	VI	1905	E
Hardman, David B.	IV	1908	E
Hardy, Philip L.	VI	1910	D
Harmon, Charles F.	I	1899	D
Harris, Charles E.	I	1905	D
Harris, George S.	I	1902	D
Harris, Louis	VII	1908	E
Harrison, Amy Goodhue	IIIb	1900	D
Harrison, Amy Goodhue	P. G. IIIb	1901	D
Hartwell, Henry E.	VI	1906	E
Hartwell, Marcus H.	I-Va	1911	E
Haskell, Spencer H.	II	1907	D
Haskell, Walter F.	IV	1902	D
Hathorn, George W.	IV	1907	D
Haven, George W.	IIIa	1905	E
Haworth, Joseph	VI	1902	E
Hay, Ernest C.	II	1911	D
Hayes, Michael C.	IIa	1909	E
Heaton, Forster G.	IV	1911	E
Hebert, Charles L. J.	IV	1907	E
Hempel, Frank	V	1904	E
Hendrickson, Walter A.	II	1911	D
Hennessey, Ambrose M.	VII	1908	E
Hennigan, Arthur J.	II	1906	D
Hering, Paul C.	IIIa	1910	E
Herrick, William E.	VII	1911	E
Hibbert, George E.	Va	1910	E
Hibbert, George E.	Vc	1911	E
Higgins, James A.	IIa	1903	E
Higgins, James A.	IIa-b	1904	E
Hildreth, Harold W.	II-V	1906	D
Hildreth, Harold W.	II	1907	D
Hill, Daniel	IIb	1901	E
Hill, Ellsworth O. C.	IIb	1910	E
Hill, Harold	I	1908	E
Hill, Harold	Va	1909	E
Hilliard, William B.	VIa	1910	E

Name	Course	Class	Day or Evening
Hillier, Arthur P.	IIb	1909	E
Hintze, Thomas F.	I	1906	D
Hird, Arthur W.	I	1910	E
Hird, James A.	IVa	1910	E
Hitchcock, Thomas B.	I-IIa-IIIa	1901	E
Hitchen, Harry S.	Vb	1907	E
Hitchen, Thomas G.	Vb	1907	E
Hodge, William	VIa	1911	E
Hodgkins, Albert A.	VII	1909	E
Hodgkins, Albert A.	IIIa	1910	E
Hoellrich, Martin J.	Vb	1908	E
Hoellrich, Martin J.	Vc	1910	E
Hoessler, Carl, Jr.	IIIa	1906	E
Hogan, James A.	V	1902	E
Holden, Francis C.	IV	1909	D
Holgate, Benjamin	III	1902	D
Holgate, Benjamin	V	1903	D
Holgate, Charles H.	IIa	1901	E
Hollings, James L.	I	1905	D
Holt, Gavin O.	IVa	1910	E
Holt, Harry C.	VIa	1909	E
Hook, Russell W.	IV	1905	D
Horsfall, George G.	II-III-V	1904	D
Houston, William I.	IIIa	1909	E
Houston, William I.	Vb	1910	E
Howard, John	V	1900	E
Howard, John	IIIa	1903	E
Howard, John	IIa	1906	E
Howard, John	VII	1907	E
Howard, Thomas	V	1905	E
Howe, Woodbury K.	I	1910	D
Howell, Edward A.	Va	1909	E
Hoyle, Edward	IIb	1902	E
Hoyle, Joseph	IIb	1904	E
Hoyt, Charles W. H.	IV	1907	D
Hubbard, Ralph K.	IV	1911	D
Huising, Geronimo H.	I	1908	D
Hunt, Chester L.	III	1905	D
Hunt, Herbert R.	VI	1905	E
Hunter, Ralph	IIIa	1901	E
Hunter, Ralph	V	1903	E
Hunton, John H.	VII	1910	E
Hunton, John H.	II	1911	D
Hunton, Lewis G.	IV	1905	E
Hurtado, Leopoldo, Jr.	Vc	1910	E
Hurtado, Leopoldo, Jr.	IV	1910	D
Hutton, Clarence	V	1900	E
Hutton, Clarence	III	1903	D
Hutton, Harold	V	1906	E
Hutton, John M.	Vb	1906	E
Hutton, Thomas V.	Vb	1910	E
Ignatius, Pentti	Va	1907	E
Inberg, Magnus	I	1906	E
Ingham, Benjamin W.	I	1908	E
Jackson, Frank	VIb	1910	E
Jean, Adhemard C.	VIa	1910	E

Name	Course	Class	Day or Evening
Jeannotte, Arthur	VI	1904	E
Jelleme, William O.	I	1910	D
Jenckes, Leland A.	VI	1908	D
Jennings, James J.	IIIa	1903	E
Jepson, Harry	Vb	1907	E
Johnson, Ernest A.	IIa-b	1902	E
Johnson, Ernest A.	V	1906	E
Johnson, Samuel L.	V	1903	E
Jones, Everett A.	III	1904	D
Jones, Everett A.	III	1905	D
Jones, William J.	IIb	1900	E
Jones, William J.	IIa	1901	E
Jordan, Frederic W.	IV	1910	E
Jorde, Linville T.	VIc	1910	E
Joyce, John	Vc	1909	E
Jury, Alfred E.	IV	1904	D
Kaler, Harold F.	VIIb	1909	E
Kay, Harry P.	II	1909	D
Keleher, John J.	IIb	1903	E
Kellett, Irvine	II	1899	E
Kelley, Bernard J., Jr.	VIc	1909	E
Kelly, Michael H.	I	1902	E
Kelly, Michael H.	IIIa	1907	E
Kennedy, William E.	VIa	1911	E
Kent, Clarence L.	III-V	1906	D
Kent, Ernest J.	IIb	1902	E
Kenworthy, Joseph	I	1905	E
Keough, Wesley L.	II	1910	D
Kershaw, Benn	Va	1909	E
Kershaw, Benn	Vc	1910	E
Kershaw, Samuel S.	IIb	1910	E
Kershaw, William E.	V	1904	E
Kidd, Thomas E.	IV	1906	E
Killerby, Walter	IIb	1901	E
Kimball, Irving D.	VI	1905	E
Kingsbury, Percy F.	IV	1901	D
Kirsch, Alfred O.	Vb	1907	E
Knowland, Daniel P.	IV	1907	D
Knowles, Frank E.	I	1903	E
Krause, George	VII	1910	E
Lachance, Melina	IIIb	1911	E
Laffert, August W.	IIIa	1906	E
Laffert, August W.	VII	1907	E
Lagerblad, Jarl	VII	1908	E
LaJeunesse, Joseph A.	IVa	1910	E
Lake, William F.	IIIa	1907	E
Lake, William F.	P. G. IIIa	1908	E
Lakeman, Fannie S.	IIIb	1900	D
Lamb, Arthur F.	II	1910	D
Lamont, Walter M.	IIb	1902	E
Lamson, George F.	I	1900	D
Lamson, George F.	VI	1905	E
Lane, John W.	I	1906	D
Lane, John W.	I-V	1907	D
Langevin, Felix D.	VI	1904	E
Laughlin, James K.	III	1909	D

Name	Course	Class	Day or Evening
Law, Alfred	IIb	1901	E
Lawliss, Augustine J.	V	1902	E
Lawrence, Charles	I	1903	E
Leach, John P.	I-V	1900	D
Leach, Joseph W.	V	1903	E
Leck, Arthur J.	VII	1910	E
Ledoux, Blanche H.	IIIb	1910	E
Lee, Charles	I	1902	E
Lee, William H.	V	1905	D
Leith, Edwin E.	IIIa	1902	E
Lemire, Arthur	I	1910	E
Lemire, Arthur	Va	1911	E
Levi, Alfred S.	IV	1909	D
Lewis, LeRoy C.	IV	1908	D
Lewis, Walter S.	IV	1905	D
Libby, C. Robert	VI	1902	E
Linberg, Joseph F.	IVa	1911	E
Lincourt, Hector L.	VI	1903	E
Lincourt, Henry E.	VIb	1909	E
Linkletter, Alfred C.	VI	1905	E
Logan, George H. S.	IV	1911	E
Lord, Harry D.	IIIa	1904	E
Lord, Wilfred	IIIa	1901	E
Lord, Wilfred	IIb	1903	E
Lord, Wilfred	IIa	1904	E
Lovell, Charles E.	VI	1905	E
Lucey, Edmund A.	II	1904	D
Mabbett, Albert L.	IIIa	1910	E
Mackay, Stewart	III	1907	D
MacPherson, Wallace A.	III	1904	D
Madden, Peter	Va	1909	E
Maden, Harry	IIb	1900	E
Maguire, James H.	VI	1905	E
Maguire, James H.	I	1906	E
Mahoney, Dennis J.	Vb	1909	E
Mailey, Howard T.	II	1908	D
Maker, Isaac A.	I	1908	E
Manning, Frederick D.	IV	1910	D
Manning, James B.	IVa	1911	E
Marjerison, Isaiah D.	II	1899	E
Marjerison, T. Sydney	IIIa	1907	E
Marjerison, T. Sydney	P. G. IIIa	1908	E
Marinel, Walter N.	I	1901	D
Marsden, Phillips B.	IVa	1911	E
Marshall, Fred K. R.	VI	1908	E
Martin, Harry W.	IV	1911	D
Martin, John C., Jr.	IIa-b	1905	E
Martin, Willard E.	IIIa	1907	E
Mason, Archibald L.	VI	1909	D
Mason, Frederick A.	I	1903	E
Maxcy, Leo M.	VIc	1910	E
McAlister, John W.	V	1899	E
McAuliffe, Patrick D.	VIb	1910	E
McBride, Robert G.	IIa	1904	E
McCarthy, Joseph F.	IIIa	1906	E
McClure, Charles G.	VIb	1909	E

Name	Course	Class	Day or Evening
McCool, Frank L.	IV	1910	D
McDonnell, William H.	I-V	1906	D
McElroy, Samuel H.	Vb	1910	E
McGill, William E.	VII	1908	E
McGovern, James	VII	1908	E
McKenna, Hugh F.	IV	1905	D
McKenna, Jerimiah J.	Vb	1908	E
McLaughlin, Peter J.	I	1906	E
McLay, John	Vb	1906	E
McLay, John	IIb	1909	E
McManus, Hugh	V	1905	E
McNamara, Thomas	Vb	1911	E
McQuade, Hugh B.	V	1901	E
Meadows, William R.	I	1904	D
Meek, Lotta (See Parker)			
Merchant, Edith C.	IIIb	1900	D
Merrill, Allan B.	IV	1911	D
Merrill, Edwin C.	VI	1904	E
Merriman, Earl C.	II	1907	D
Messiah, Hiram G.	Vb	1910	E
Micheltmore, Harry	IIIa	1906	E
Micheltmore, Harry	VII	1907	E
Midwood, Arnold J.	IV	1905	D
Miller, Emil H.	V	1904	E
Milot, Joseph E.	VIc	1911	E
Minge, Jackson C.	I-V	1901	D
Minge, Jackson C.	IIIa	1901	E
Moir, Alexander L.	IIIa	1899	E
Moir, Alexander L.	P. G. IIIa	1903	E
Molloy, Andrew	V	1902	E
Molloy, Andrew	IIIa	1905	E
Molloy, Andrew	P. G. IIIa	1906	E
Molloy, Andrew	P. G. IIIa	1909	E
Moore, Everett B.	I	1905	D
Moore, Karl R.	IV	1911	D
Moorehouse, Thomas	VI	1904	E
Moorhouse, William R.	IV	1901	D
Morris, Frank A.	V	1901	E
Morrison, Fred C.	I	1903	D
Mortenson, Carl W.	IIIa	1903	E
Mortenson, Carl W.	IIa	1908	E
Morton, Albert N.	IIb	1906	E
*Mozley, Arthur	VI	1903	E
Mullen, Arthur T.	II	1909	D
Murphy, Cornelius D.	IIa	1906	E
Murphy, Howard H.	IIb	1911	E
Murphy, John H.	VI	1904	E
Murray, James A.	II	1910	D
Musard, Albert E., Jr.	Vc	1909	E
Myers, James W.	IIIa-IV	1903	E
Myers, James W.	VII	1907	E
Najarian, Garabed	IV	1903	D
Nelson, Charles E.	IIb	1907	E
Nelson, Ernest H.	IIb	1900	E
Nelson, Ernest H.	IIa	1901	E

*Deceased

Name	Course	Class	Day or Evening
Nelson, Ernest H.	IIIa	1906	E
Nelson, Ernest H.	I	1909	E
Nelson, Ernest H.	Vc	1910	E
Nelson, Gustave A.	Vb	1910	E
Nelson, James A.	I	1911	E
Nelson, Sigfred	VIId	1911	E
Newall, J. Douglas	IV	1909	D
Newall, Preston	I	1911	E
Newcomb, Guy H.	IV	1906	D
Newsholme, Charles E.	VIb	1911	E
Nichol, Samuel J.	IVa	1911	E
Nichols, Clarence W.	Vb	1910	E
Nichols, Nathan A.	VIb	1911	E
Nichols, Raymond E.	VI	1910	D
Nicholson, Richard	IIb	1903	E
Nicoll, John	IVa	1910	E
Noble, John T.	V	1899	E
Noble, John T.	IIIa	1901	E
Noonan, Denis T.	IIIa	1903	E
Notman, Frederick W.	I	1904	E
Nugent, Thomas A.	II-V	1899	E
Nugent, Thomas A.	VI	1902	E
Nutter, James R.	VI	1908	E
O'Brien, David A.	IV	1906	E
O'Brien, Michael F.	IIb	1907	E
O'Connell, Clarence E.	IV	1911	D
O'Donnell, John D.	I-V	1904	D
Ogley, Samuel A.	IIb	1900	E
O'Hara, William F.	IV	1904	D
O'Neill, Peter F.	IV	1905	E
Orrell, Frank L.	VIb	1909	E
*Osbeck, William J.	IIIa	1908	E
Osgood, Charles F.	I	1900	E
Osgood, Charles F.	VI	1902	E
Overend, John	V	1905	E
Palmer, G. Buel	IIIa	1903	E
Palmer, G. Buel	Vb	1909	E
Paquin, Joseph	VIa	1909	E
Paquin, Joseph	VIb	1910	E
Parker, B. Moore	I	1901	D
Parker, Everett N.	I-III-V	1904	D
Parker, Everett N.	I	1905	D
Parker, Harry C.	V	1900	D
Parker, Lotta Meek	IIIb	1907	D
Parkin, Prescott R.	Vb	1911	E
Parkis, William L.	I	1909	D
Parsons, Joseph G.	IIIa	1909	E
Patrick, Alexander	IIIa	1904	E
Patterson, Alfred H.	IIIa	1908	E
Pearson, Alfred H.	IV	1911	D
Pearson, Fred	VIa	1909	E
Pease, Chester C.	I	1909	D
Pedler, William A.	I	1906	E
Pedler, William A.	IVa	1911	E
Peel, Hudson	IIb	1901	E

*Deceased

Name	Course	Class	Day or Evening
Perkins, John E.	III	1900	D
Perkins, J. Dean	III	1908	D
Perkins, Thomas, Jr.	I	1908	E
Perron, Francis J.	Vb	1911	E
Perry, Clarence R.	IIb	1911	E
Petterson, Birger	VIa	1910	E
Petty, George E.	I-V	1903	D
Phelps, Mary I.	IIIb	1910	E
Picken, William	IIIa	1908	E
Pihl, Christian E.	VI	1906	E
Pittendreigh, John M.	I	1906	E
Plumer, Paul T.	Vb	1908	E
Porter, George K., Jr.	IIIa	1907	E
Porter, George K., Jr.	P. G. IIIa	1908	E
Potter, Carl H.	I	1909	D
Potter, Richard W.	V	1902	E
Pradel, Alois J.	III	1900	D
Pradel, Anna Walker	IIIb	1903	D
Preble, George A.	IIIa	1908	E
Prescott, Walker F.	IV	1909	D
Prince, Sylvanus C.	VI	1908	D
Proctor, Braman	IV	1908	D
Putnam, Leverett N.	IV	1910	D
Racicot, Marie E.	IIIb	1911	E
Ramsdell, Theodore E.	I	1902	D
*Rasche, William A.	III	1903	D
Raymond, Charles A.	IV	1907	D
Read, Paul A.	VII	1907	E
Read, Paul A.	Va	1909	E
Reardon, Timothy H.	VI	1906	E
Redman, Henry S.	IIIa	1904	E
Redman, Henry S.	V	1905	E
Redman, Henry S.	I	1907	E
Redman, Henry S.	IV	1910	E
Reed, Foster C. K.	VI	1904	E
Reed, Norman B.	I	1910	D
Reynolds, Eugene A.	VI	1906	E
Reynolds, Fred B.	II	1908	D
Reynolds, Hiram L.	IIIa	1901	E
Reynolds, Isabel H.	III-V	1903	D
Reynolds, Isabel H.	P. G. III-V	1906	D
Rhodes, Joseph E.	V	1904	E
Rich, Everett B.	III	1911	D
Richards, Francis G.	IIa	1906	E
Ritter, Alfred E.	IIb	1907	E
Robbins, John	IIb	1907	E
Roberson, Pat H.	I	1905	D
Roberts, Carrie I.	IIIb	1905	D
Robinson, Ernest W.	IV	1908	D
Robinson, James E.	VII	1911	E
Robinson, Ruddach P.	VII	1911	E
Robinson, Thomas	I	1909	E
Robinson, Thomas	Vc	1910	E
Robinson, William C.	III-V	1903	D
Robson, Frederick W. C.	IV	1910	D

*Deceased

Name	Course	Class	Day or Evening
Rockwell, Henry D.	IIa	1903	E
Rockwell, Samuel F.	IIa	1902	E
Rogers, John F.	I	1911	E
Rooney, George W.	I	1904	E
Root, Francis X., Jr.	IIIa	1910	E
*Rowell, Herman C.	I-IIb	1900	E
Rowlands, Harold	Va	1911	E
Rushworth, Walter	VI	1906	E
Ryan, Edward P.	I	1909	E
Saalfrank, Joseph C.	IIIa	1908	E
Saunders, Edward B.	IIIa	1901	E
Saunders, Harold F.	IV	1909	D
Scally, Edward	VI	1908	E
Scanlon, Edward J.	IIb	1901	E
Schermerhorn, George E.	I	1902	E
Schermerhorn, George E.	Va	1908	E
Schofield, John S.	IIIa	1903	E
Schoon, Fenton	IIb	1903	E
Schubert, George J.	V	1906	E
Schubert, George J.	IIIa	1909	E
Schuerfeld, Harry W.	IIIa	1909	E
Schuster, William F.	VII	1908	E
Seddon, N. Graham	IIIa	1908	E
Semple, Alexander	IIIa	1908	E
Senior, George	Va	1906	E
Senior, George	I-Vc	1907	E
Shackelton, John H.	IV	1908	E
Shackleton, John H.	I	1910	E
Shaffer, William A.	VId	1911	E
Shannon, Philip J.	V	1901	E
Sharpe, John R.	VI	1906	E
Shaw, James	V	1904	E
Sheppard, Byron H.	VI	1906	E
Shields, John J.	Va	1911	E
Sidebottom, Leon W.	IV	1911	D
Silcox, Arthur E.	I	1900	E
Silk, Frederick C. M.	IV	1905	E
Silk, Patrick E.	VII	1906	E
Simola, Emil J.	IIa-b	1905	E
Simoneau, Verner W.	VI	1908	E
Skinner, Clarence W.	IIIa	1905	E
Skinner, Clarence W.	P. G. IIIa	1906	E
Skinner, Clarence W.	VII	1907	E
Sleeper, Robert R.	IV	1900	D
*Smith, Albert A.	I	1899	D
Smith, Arthur	IIIa	1905	E
Smith, Arthur	P. G. IIIa	1906	E
Smith, Arthur	Va	1906	E
Smith, Arthur	Vc	1907	E
Smith, Arthur	P. G. IIIa	1909	E
Smith, Doane W.	II	1910	D
Smith, Edward	I	1904	E
Smith, Ernest B.	Vb	1907	E
Smith, Fred	IIb	1901	E
Smith, George A.	IIIa	1905	E

*Deceased

Name	Course	Class	Day or Evening
Smith, George A.	P. G. IIIa	1906	E
Smith, George A.	VII	1909	E
Smith, James	Vb	1907	E
Smith, John W.	IIb	1904	E
Smith, Percy H.	Vb	1907	E
Smith, Ralston F.	I	1904	D
Smith, Stephen E.	I	1900	D
Smith, Theophilus G., Jr.	IV	1910	D
Smith, William E.	IIIa	1905	E
Smith, William E.	P. G. IIIa	1906	E
Smith, William E.	VII	1907	E
Smith, William E.	P. G. IIIa	1909	E
Smith, William H.	IIb	1902	E
Snelling, Fred N.	II	1903	D
Snow, Fred L.	IV	1900	E
Spedding, Ephraim H.	IIIa	1899	E
Spiegel, Edward	V	1903	D
Spurr, Albert R.	VII	1908	E
Spurr, James H., Jr.	IV	1908	E
Standish, John C.	IV	1911	D
Stanley, John R.	IIb	1911	E
Stearns, Orlo F.	IVa	1911	E
Sterling, Walter	IIIa	1904	E
Stevens, Dexter	I	1904	D
Stevens, Frank W.	VI	1905	E
Stevenson, Murray R.	III-V	1903	D
Stevenson, William	II	1899	E
Stevenson, William	IIIa	1902	E
Stewart, Arthur A.	II	1900	D
Stewart, Charles	Va	1908	E
Stewart, George	I-IVa	1911	E
Stewart, Walter L.	III	1903	D
Stewart, William W.	IV	1910	E
Stockham, Burton I.	IV	1903	E
Stockham, Burton I.	P. G. IV	1904	E
Stocks, Carl W.	VIa	1909	E
Stohn, Alexander C.	III-V	1906	D
Stone, Ira A.	IV	1909	D
Stopherd, William H.	II-V	1899	E
Stopherd, William H.	VI	1902	E
Stopherd, William H.	IIIa	1905	E
Stopherd, William H.	P. G. IIIa	1906	E
Stopherd, William H.	P. G. IIIa	1909	E
Stopherd, William H.	VII	1910	E
Storer, Francis E.	II	1907	D
Stott, Bertram S.	Vb	1910	E
Stott, Samuel	IV	1910	E
Stronach, Irving N.	IV	1910	D
Stursberg, Paul W.	II	1907	D
Sullivan, Humphrey F.	I	1909	E
Sullivan, Michael F.	VIb	1910	E
Swan, Guy C.	II	1906	D
Swift, Edward S.	V	1899	E
Swift, Edward S.	I	1901	E
Swift, Edward S.	I	1902	D
Sykes, Alvin E.	VIa	1909	E

Name	Course	Class	Day or Evening
Syme, James F.	II	1900	D
Tarpey, John F.	IIa	1904	E
Teichmann, Alfred A.	Vb	1908	E
Tennant, Joseph A.	VIb	1911	E
Thomas, Roland V.	I	1905	D
Thompson, Charles B.	VI	1904	E
Thompson, Everett L.	I	1905	D
Thompson, Henry J.	IV	1900	D
Tilton, Elliott T.	II	1899	D
Todd, Henry	VII	1910	E
Tonge, John	IV	1905	E
Tonge, Matthew	IIIa	1903	E
Toovey, Sidney E.	V	1904	D
Toshach, Reginald A.	II	1911	E
Tucker, John T.	I	1908	E
Tucker, John T.	Va	1909	E
Umpleby, Thomas B.	V	1902	E
Upton, Frank A.	I	1903	E
Varney, Manley H.	IIIa	1902	E
Varney, Manley H.	I	1903	E
Varnum, Arthur C.	II	1906	D
Varnum, Arthur C.	Vb	1907	E
Varnum, Arthur C.	P. G. IIIa	1908	E
Varnum, Arthur C.	VII	1909	E
Vogt, Alfred H.	IIIa	1902	E
Vogt, Alfred H.	IIb	1909	E
Vogt, Harry A.	Vb	1906	E
Wade, Frank J.	Vb	1911	E
Walker, Alfred S.	II	1911	D
Walker, Anna G. (See Pradel)			
Walker, David	IIIa	1902	E
Walker, David	P. G. IIIa	1903	E
Walker, William, Jr.	VII	1906	E
Walsh, Michael L.	I	1909	E
Walton, Frank L.	I	1911	E
Ward, Bernard D.	IIIa	1911	E
Ward, James J.	VII	1906	E
Wardrobe, William L.	I	1900	E
Ware, Edward W.	IIIa	1909	E
Warren, Philip H.	II	1905	D
Waterhouse, Joseph	IV	1900	E
Waterworth, Frank W.	Vb	1907	E
Watson, Luther F.	IIb	1909	E
Watson, William	III	1911	D
Webb, Francis H.	V	1904	E
Webb, Francis H.	IIIa	1907	E
Webb, Frank H.	IV	1904	D
Webber, Arthur H.	IV	1901	D
Webber, John F.	IIIa	1907	E
Webber, John F.	P. G. IIIa	1908	E
Weigel, Frederick A.	VIb	1909	E
Weinz, W. Elliott	IV	1908	D
Welch, Benjamin L.	VIb	1910	E
Wesson, Paul B.	I	1901	E
Wahlberg, Einar S.	I	1907	E

Name	Course	Class	Day or Evening
Wheelock, Stanley H.	II	1905	D
*Whitcomb, Harry E.	I	1906	E
Whitcomb, Roscoe M.	IV	1910	D
White, Royal P.	II	1904	D
Whitehead, Bennett	IIb	1901	E
Whitman, William P.	IVa	1910	E
Whitney, Frederick A.	IV	1910	E
Whittaker, Thomas	IIb	1907	E
Whittaker, Thomas	IIb	1908	E
Wiggin, Leon M.	IIIa	1907	E
Wiggin, Leon M.	P. G. IIIa	1908	E
Wightman, William H.	IV	1906	D
Wilde, Thomas E.	IIa	1905	E
Willey, Frank S.	I	1901	E
Willgeroth, Henry J.	IIIa	1908	E
Williams, Allen R.	I	1910	E
Williams Allen R.	Va	1911	E
Williamson, Isaac F.	IV	1901	E
Willmott, Herbert J.	VIa	1911	E
Wilmot, Joseph	IIIa	1908	E
Wilmot, William	IIIa	1899	E
Wilson, Calvin E.	IIb	1902	E
Wilson, George H.	IIb	1902	E
Wilson, John S.	II	1903	D
*Wilson, Walter E. H.	I-V	1904	D
Wilton, George H.	IIIa	1899	E
Wing, Charles T.	IIIa	1900	E
Wing, Charles T.	III	1902	D
Wingate, William H.	IV	1908	D
Wise, Paul T.	II	1901	D
Wiswall, Frank T.	V	1905	E
Wolf, William C.	Va	1907	E
Wolf, William C.	Vb	1908	E
Wolger, John J.	IIIa	1907	E
Wollin, Frederick W.	Va	1911	E
Wood, Ernest H.	IV	1911	D
Wood, Herbert C.	I	1906	D
Wood, J. Carleton	IV	1909	D
Wood, Jonathan	I	1902	E
Wood, Jonathan	Va	1908	E
Woodbury, W. Sanford	I	1900	E
Woodcock, Eugene C.	II	1907	D
Woodies, Ida A.	IIIb	1900	D
Woodies, Ida A.	P. G. IIIb	1901	D
Woodman, Harry L.	I-III-V	1902	D
Woodruff, Charles B.	V	1906	D
Worthington, John A.	I	1910	E
Wright, Edward, Jr.	II	1905	D
Wright, Frederick J.	Vb	1911	E
Yare, John F.	Vb	1907	E
Young, Richard, Jr.	Va	1908	E
Young, Richard, Jr.	Vc	1909	E

*Deceased

REGISTER OF GRADUATES

(P. G.) Indicates Post Graduate Course

(x) Indicates Last Known Address

(*) Deceased

Day Course, 1899

Diploma Graduates		
Name	Course	Occupation
xBailey, Joseph W.	I	Superintendent, Samoset Mills, Valley Falls, R. I.
Cuttle, James H.	II	Designer, William Whitman and Co., New York City.
Fels, August B.	II	Salesman, William Fels & Sons, New York City.
Harmon, Charles F.	I	In business, Lowell, Mass.
*Smith, Albert A.	I	
Tilton, Elliott T.	II	With Western Electric Co., Boston, Mass.

Certificate Holders

Burrage, Katherine C.	IIIb	Pottery Teacher, Social Service Dept., Massachusetts General Hospital, Boston, Mass.
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Evening Course, 1899

Certificate Holders

*Berry, Frank M.	IIIa	
xBinns, Heaton	II-V	Foreman, Worsted Department, Shuttleworth Bros. Co., Amsterdam, N. Y.
xBroadbent, James T.	I	In Converting House, New York City.
xCollier, John	IIIa	Superintendent, American Woolen Company, No. Vassalboro, Me.
Crompton, Henry H.	II	Overseer, Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
Gaunt, Alfred C.	IIIa	Treasurer and Manager, Tremont Worsted Co., Methuen, Mass.
Kellett, Irvine	II	Second Hand, Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
Marjerison, Isaiah D.	II	Second Hand, Worsted Combing, Lower Pacific Mills, Lawrence, Mass.
*McAlister, John W.	V	
Moir, Alexander L.	IIIa	Letter Carrier, Lowell, Mass.
xNoble, John T.	V	With Amoskeag Mfg. Co., Manchester, N. H.
Nugent, Thomas A.	II-V	Foreman, Worsted Department, McClarey, Wallin & Crause, Amsterdam, N. Y.
Spedding, Ephraim H.	IIIa	Overseer, Weaving, Massachusetts Cotton Mills, Lowell, Mass.
xStevenson, William	II	Superintendent, Franklin Woolen Mills, Franklin, Ky.
Stopherd, William H.	II-V	Overseer, Worsted Spinning, Bigelow Carpet Co., Lowell, Mass.

Name	Course	Occupation
Swift, Edward S.	V	Scholastic of the Society of Jesus, St. Andrew-on-Hudson, Poughkeepsie, N. Y.
Wilmot, William	IIIa	Designer, Hamilton Webb Co., Hamilton, R. I.
xWilton, George H.	IIIa	Overseer, M. T. Stevens and Sons Company, North Andover, Mass.

Day Course, 1900

Diploma Graduates

Baldwin, Arthur L.	IV	Dyer, Appleton Co., Lowell, Mass.
Barr, I. Walwin	I	Styler, F. U. Stearns & Co., New York City.
Bodwell, Henry A.	II	Superintendent, Smith and Dove Mfg. Co., Andover, Mass.
Brickett, Chauncey J.	II	Principal, School of Textiles, International Correspondence Schools, Scranton, Pa.
xLamson, George F.	I	Draftsman, Chas. T. Main, Boston, Mass.
Perkins, John E.	III	Assistant Superintendent, S. N. and C. Russell Mfg. Co., Pittsfield, Mass.
Pradel, Alois J.	III	Designer and Assistant Superintendent, Montrose Mills, Woonsocket, R. I.
Sleeper, Robert R.	IV	Instructor in Dyeing, Lowell Textile School, Lowell, Mass.
Smith, Stephen E.	I	Head Instructor, Cotton Department, Lowell Textile School, Lowell, Mass.
Stewart, Arthur A.	II	Head Instructor, Finishing, Lowell Textile School, Lowell, Mass.
Syme, James F.	II	Agent, Saxonville Mills, Saxonville, Mass.
Thompson, Henry J.	IV	Dyer, Boston Rubber Shoe Co., Malden, Mass.

Certificate Holders

Burrage, Katherine C.	P. G.	IIIb	See Day Course, 1899.
Campbell, Laura E.		IIIb	Designer, Lowell, Mass.
xHarrison, Mrs. Amy H. (Goodhue)		IIIb	Dracut, Mass.
Lakeman, Fannie S.		IIIb	Designer, Salem, Mass.
xLeach, John P.		I-V	Foreman, Harriet Cotton Mills, Henderson, N. C.
Merchant, Edith C.		IIIb	Designer, Lowell, Mass.
Parker, Harry C.		V	With Parker Piano & Victrola Co., Boston, Mass.
Woodies, Ida A.		IIIb	Designer, Boston, Mass.

Evening Course, 1900

Certificate Holders

Campbell, Albert D.	IIb	Worsted Drawer, Arlington Mills, Lawrence, Mass.
xCawthra, Albert B.	IIb	Overseer, Silesia Worsted Mills, North Chelmsford, Mass.

Name	Course	Occupation
Colby, Arthur D.	I	Draftsman, Lowell Machine Shop, Lowell, Mass.
Donnelly, James	I	Fixer, Worsted Mules, Manchester Mills, Manchester, N. H.
Elston, Fred R.	IIIa	Assistant Superintendent and Designer, Shackamaxon Worsted Co., Philadelphia, Pa.
Howard, John	V	Overseer, Weaving, Masconia Mill, Lebanon, N. H.
Hutton, Clarence	V	Circulation Manager, Lord and Nagle Co., Boston, Mass.
Jones, William J.	IIb	Worsted Spinner, U. S. Bunting Co., Lowell, Mass.
xMaden, Harry	IIb	North Adams, Mass.
Nelson, Ernest H.	IIb	Designer, Merrimack Mfg. Co., Lowell, Mass.
Ogley, Samuel A.	IIb	Overseer, Worsted Spinning, Brookside Worsted Mills, West Chelmsford, Mass.
xOsgood, Charles F.	I	Draftsman, General Electric Company, Lynn, Mass.
*Rowell, Herman C.	I-IIb	
Silcox, Arthur E.	I	Draftsman, Lowell Machine Shop, Lowell, Mass.
Snow, Fred L.	IV	Granite Contractor, Snow & Horsfall, Lowell, Mass.
xWardrobe, Wm. L.	I	Ware, Mass.
xWaterhouse, Joseph	IV	Section Hand, Merrimack Mfg. Company, Lowell, Mass.
Wing, Charles T.	IIIa	Designer, Middlesex Mfg. Company, Lowell, Mass.
Woodbury, W. Sanford	I	Overseer, Carding, Orswell Mills, Fitchburg, Mass.

Day Course, 1901

Diploma Graduates

Buchan, Donald C.	II	Assistant Superintendent, Stevens Mills, North Andover, Mass.
Currier, John A.	II	Superintendent, Pentucket Mills, M. T. Stevens and Sons Co., Haverhill, Mass.
Ewer, Nathaniel T.	IV	Chemist, American Dyewood Co., Chester, Pa.
Foster, Clifford E.	II	Superintendent of Spinning, Cheney Bros., South Manchester, Conn.
Kingsbury, Percy F.	IV	Overseer, Color Dept., Merrimack Mfg. Co., Lowell, Mass.
Marinel, Walter N.	I	In Automobile Business, North Chelmsford, Mass.
Moorhouse, William R.	IV	Chemist, Cassella Color Co., Boston, Mass.
Parker, B. Moore	I	Instructor, Carding and Spinning, A. and M. College, West Raleigh, N. C.
xWebber, Arthur H.	IV	Beverly, Mass.
Wise, Paul T.	II	Agent, Bigelow Carpet Co., Clinton, Mass.

Certificate Holders

Name	Course	Occupation
Bradley, Richard H.	V	Second Hand and Designer, Arkwright Mill, Fall River, Mass.
xHarrison, Mrs. Amy H. (Goodhue)	P. G. IIIb	See Day, 1900.
Minge, Jackson C.	IV	Treasurer, Minge Mfg. Co., Demopolis, Ala.
Woodies, Ida A.	P. G. IIIb	See Day, 1900.

Evening Course, 1901

Certificate Holders

xAspinwall, William	IIb	Philadelphia, Pa.
*Berry, Frank M.	V	
xBrooks, Noah	IIIa-V	Lowell, Mass.
xBurghardt, Paul C.	IIa	Second Hand, Card Room, Merrimack Woolen Co., Lowell, Mass.
Buzzell, William O.	IIIa	Overseer, Weaving, Bristol Mfg. Co., New Bedford, Mass.
xCheetham, John James	IIIa	Brunswick, Me.
Chippindale, Ernest W.	IIb	Section Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Cowdell, Herbert	V	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
*Davis, Henry	IIb	
xDonovan, Daniel F.	IIa	Second Hand, Woolen Carding, Yonkers, N. Y.
Evison, William A.	V	Loomfixer, Prescott Mills, Lowell, Mass.
Farrell, Thomas	IIa	Woolen Spinner, Stirling Mills, Lowell, Mass.
Frame, William C.	V	Overseer, Johnson & Johnson, New Brunswick, N. J.
Gagan, John H.	V	Lawrence, Mass.
Grant, Archibald	IIb	Overseer, Spinning, Bigelow Carpet Co., Lowell, Mass.
Grouke, Michael	IIb	Overseer, Drawing, Bigelow Carpet Company, Lowell, Mass.
Hill, Daniel	IIb	Overseer, Maine Alpaca Co., Springvale, Me.
Hitchcock, Thomas B.	I-IIa-IIIa	Assistant to General Manager, Consolidated Cotton Duck Company, New York City.
Holgate, Charles H.	IIa	With A. R. Andrews, Boston, Mass.
Hunter, Ralph	IIIa	Salesman, Hall, Hartwell and Company, Troy, N. Y.
Jones, William J.	IIa	See Evening, 1900.
Killerby, Walter	IIb	Overseer, Park Worsted Mill, Lowell, Mass.
Law, Alfred	IIb	Overseer, Arlington Mills, Lawrence, Mass.
Lord, Wilfred	IIIa	Assistant Superintendent, Worsted Dept., Lower Pacific Mills, Lawrence, Mass.
McQuade, Hugh B.	V	Loomfixer, Bigelow Carpet Company, Lowell, Mass.

Name	Course	Occupation
Minge, Jackson C.	IIIa	See Day, 1901.
xMorris, Frank A.	V	Loomfixer, Lowell, Mass.
Nelson, Ernest H.	IIa	See Evening, 1900.
Noble, John T.	IIIa	See Evening, 1899.
xPeel, Hudson	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
Reynolds, Hiram L.	IIIa	Agent, Saunders Cotton Mills, Saundersville, Mass.
Saunders, Edward B.	IIIa	Salesman, Remington Typewriter Co., Fall River, Mass.
Scanlon, Edward J.	IIb	In business, Lawrence, Mass.
Shannon, Philip J.	V	Loomfixer, American Woolen Co., Lebanon, N. H.
xSmith, Fred	IIb	Superintendent, Yarn Dept., Wood Worsted Mills, Lawrence, Mass.
Swift, Edward S.	I	See Evening, 1899.
Wesson, Paul B.	I	Foreman Machinist, Lowell Machine Shop, Lowell, Mass.
Whitehead, Bennett	IIb	Overseer, Wood Worsted Mills, Lawrence, Mass.
xWilley, Frank S.	I	Second Hand, Picking and Carding, Pacific Mills, Lawrence, Mass.
Williamson, Isaac F.	IV	Overseer, Dyeing Dept., Hamilton Mfg. Co., Lowell, Mass.

Day Course, 1902

Diploma Graduates

xBurnham, Frank E.	IV	Chemist, Avery Chemical Co., Boston, Mass.
Carter, Robert A.	IV	Chemist and Textile Expert, Roessler & Hasslach Chemical Company, New York City.
xCraig, Clarence E.	III	With Kansas City Cotton Mills Co., Kansas City, Kans.
Haskell, Walter F.	IV	Overseer of Dyeing, Dana Warp Mills, Westbrook, Me.
Ramsdell, Theodore E.	I	Agent, Monument Mills, Housatonic, Mass.
Swift, Edward S.	I	See Evening, 1899.
Wing, Charles T.	III	See Evening, 1900.

Certificate Holders

Curran, Charles E.	II-III-V	Head Designer, Wood Worsted Mills, Lawrence, Mass.
Ferguson, Arthur F.	I	Investigator, Tariff Board, Washington, D. C.
Harris, George S.	I	Agent, Lanett Cotton Mills, Lanett, Ala.
Holgate, Benjamin	III	Cost Accountant, Boott Mills, Lowell, Mass.
Woodman, Harry L.	I-III-V	Machinist, Lamson Consolidated Store Service Co., Lowell, Mass.

Evening Course, 1902

Certificate Holders

Name	Course	Occupation
xAdams, Wm. R.	IIa	Pressman, Stevens Mills, No. Andover, Mass.
Barlow, Robert	V	Lowell, Mass.
Binns, Heaton	VI	See Evening, 1899.
Bowring, George P. B.	VI	Machinist, Lowell Machine Shop, Lowell, Mass.
xBrainerd, Irving L.	I	Overseer, Carding, W. L. Barrell and Co., Lawrence, Mass.
xBurghardt, Edward S.	IIa	Lawrence, Mass.
Buzzell, Wm. O.	P. G. IIIa	See Evening, 1901.
Cheetham, John James	P. G. IIIa	See Evening, 1901.
Collier, John	P. G. IIIa	See Evening, 1899.
Cowdrey, Charles E.	V	Overseer, Talbot Mills, North Billerica, Mass.
xCremin, Daniel J.	I	Second Hand, Boott Mills, Lowell, Mass.
xDonnellan, Frank T.	IIa	Lowell, Mass.
xDudley, George E.	I	Third Hand, Carding, Mass. Mills, Lowell, Mass.
Ferguson, Thomas	V	Overseer, Boott Mills, Lowell, Mass.
xField, Charles W.	VI	Draftsman, C. F. Morrill, Somerville, Mass.
xForrest, Fred G.	IIa	Finishing Room, Middlesex Co., Lowell, Mass.
Fortune, David A.	IIb	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Gaunt, Alfred C.	P. G. IIIa	See Evening, 1899.
xGood, Henry	I	Providence, R. I.
xHaigh, Walter	IIIa	U. S. Bunting Co., Lowell, Mass.
xHaworth, Joseph	VI	Travelling Machinist, C. G. Sargent's Sons Corp., Graniteville, Mass.
Hogan, James A.	V	Hogan Bros., Lowell, Mass.
Hoyle, Edward	IIb	Manager, Allerton Worsted Mills, Lowell, Mass.
xJohnson, Ernest A.	IIa-b	Asst. Supt., Washington Mills, Lawrence, Mass.
Kelly, Michael H.	I	Overseer, Appleton Co., Lowell, Mass.
Kent, Ernest J.	IIb	Section Hand, English Drawing, Lower Pacific Mills, Lawrence, Mass.
Lamont, Walter M.	IIb	Agent, Wood Worsted Mill, Lawrence, Mass.
xLawliss, Augustine J.	V	Overseer, Weaving, Belvidere Woolen Co., Lowell, Mass.
Lee, Charles	I	Machinist, Lowell Machine Shop, Lowell, Mass.
Leith, Edwin E.	IIIa	Assistant Superintendent, Thos. Kent Mfg. Co., Clifton Heights, Pa.
Libby, C. Robert	VI	Draftsman, Locks & Canals, Lowell, Mass.
Molloy, Andrew	V	Overseer, Tremont and Suffolk Mills, Lowell, Mass.
Nugent, Thomas A.	VI	See Evening, 1899.
Osgood, Charles F.	VI	See Evening, 1900.
Potter, Richard W.	V	Second Hand, Weaving, Mass. Cotton Mills, Lowell, Mass.

Name	Course	Occupation
Rockwell, Samuel F.	IIa	Superintendent, Mule Dept., Davis and Furber Machine Co., No. Andover, Mass.
Schermerhorn, George E.	I	Overseer, Boott Mills, Lowell, Mass.
Smith, Wm. H.	IIb	Stamp Clerk, Postoffice, Lawrence, Mass.
Stevenson, William	IIIa	See Evening, 1899.
Stopherd, Wm. H.	VI	See Evening, 1899.
xUmpleby, Thomas B.	V	Superintendent, J. A. Humphrey and Son, Ltd., Moncton, N. B.
xVarney, Manley H.	IIIa	Superintendent, Finishing Dept., Amoskeag Mfg. Co., Manchester, N. H.
xVogt, Alfred H.	IIIa	Designing Room, George E. Kunhardt, Lawrence, Mass.
Walker, David	IIIa	Overseer, Burlington Mills, Winooski, Vt.
Wilson, Calvin E.	IIb	Methuen, Mass.
Wilson, George H.	IIb	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Wood, Jonathan	I	Overseer, Boott Mills, Lowell, Mass.

Day Course, 1903

Diploma Graduates

xBloom, Wilfred N.	IV	Assistant Manager, Read, Holiday and Sons, Ltd., New York City.
Campbell, Orison S.	II	Superintendent, American Felt Co., Dolgeville, N. Y.
Chamberlin, Frederick E.	I	Overseer of Spinning, Monument Mills, Housatonic, Mass.
Emerson, Frank W.	II	Superintendent, Moosup Mills, Moosup, Conn.
xEvans, Alfred W.	III	Arlington Mills, Lawrence, Mass.
xEvans, William R.	III	Bradford, Mass.
Ferguson, Arthur F.	I	See Day, 1902.
Fuller, George	I	Fabric Expert and Assistant Editor, American Wool and Cotton Reporter, New York City.
Gerrish, Walter	III	With Allen Lane Co., Boston, Mass.
Morrison, Fred C.	I	Assistant Superintendent, Levi W. Phelps, Ayer, Mass.
Najarian, Garabed	IV	Overseer of Dyeing, Monument Mills, Housatonic, Mass.
*Rasche, Wm. A.	III	
xSnelling, Fred N.	II	With American Express Co., Haverhill, Mass.
Stewart, Walter L.	III	Cotton Goods Converter, Charles Kohlman & Co., Inc., New York City.
xWilson, John S.	II	With H. Banendahl & Co., New York City.

Certificate Holders

Bennett, Edward H.	V	Manager, F. P. Bennett and Co., New York City.
Campbell, Louise P.	IIIb	Designer, Lowell, Mass.
Holgate, Benjamin	V	See Day, 1902.
Hutton, Clarence	III	See Evening, 1900.
Petty, George E.	I-V	Electric Contractor, Greensboro, N. C.

Name	Course	Occupation
Pradel, Mrs. A. J. (Walker)	IIIb	Woonsocket, R. I.
Reynolds, Isabel H.	III-V	Clerk, Arlington Mills, Lawrence, Mass.
xRobinson, William C.	III-V	With Russell Mfg. Co., Middletown, Conn.
Spiegel, Edward	V	In business, New York City.
xStevenson, Murray R.	III-V	Draftsman, City Hall, Pasadena, Cal.

Evening Course, 1903

Certificate Holders

Adams, Henry S.	IIa	Secretary and Treasurer, The Springstein Mills, Chester, S. C.
Balmforth, James H.	IIa	Postal Clerk, P. O., Bloomfield, N. J.
Barry, Edward J.	IIIa	Overseer, Jackson Company, Nashua, N. H.
Bastow, Henry	IIIa	With Arlington Mills, Lawrence, Mass.
xBaxter, Alvah J.	IIa	Bookkeeper, Assabet Mills, Maynard, Mass.
Byam, Walter S.	VI	Timekeeper, Lowell Machine Shop, Lowell, Mass.
Cady, Dennis J.	V	Section Hand, Washington Mills, Lawrence, Mass.
Donnellan, Frank T.	V	See Evening, 1902.
Flynn, John J.	VI	City of Lowell Fire Dept., Lowell, Mass.
French, Mrs. Martha B. (Balmforth)	IIIa	Tewksbury, Mass.
Garner, William	IIIa	Foreman of Refinery, Warren Bros. Co., Washington, D. C.
Gaunt, Alfred C.	IIa	See Evening, 1899.
Goodchild, George	I	Draftsman, Lowell Machine Shop, Lowell, Mass.
Gray, Finley M.	VI	Clerk, Merrimack Mfg. Co., Lowell, Mass.
xHiggins, James A.	IIa	Spinner, Talbot Mills, No. Billerica, Mass.
Howard, John	IIIa	See Evening, 1900.
Hunter, Ralph	V	See Evening, 1901.
Jennings, James J.	IIIa	Designer, Lyman Mills Co., Holyoke, Mass.
Johnson, Samuel L.	V	Second Hand, Weaving, Arlington Mills, Lawrence, Mass.
Keleher, John J.	IIb	Overseer, Drawing Dept., Prospect Mill, Lawrence, Mass.
Knowles, Frank E.	I	Inspector, Factory Mutual Insurance Co., Boston, Mass.
xLawrence, Charles	I	Overseer, Mule Spinning, Dartmouth Corp., New Bedford, Mass.
xLeach, Joseph W.	V	Designer, Pacific Mills, Lawrence, Mass.
Lincourt, Hector L.	VI	Tool Draftsman, Taft-Peirce Mfg. Co., Woonsocket, R. I.
Lord, Wilfred	IIb	See Evening, 1901.
xMason, Frederick A.	I	Mule Spinner, Saxony Worsted Mills, Newton, Mass.
Moir, Alexander L.	P. G. IIIa	See Evening, 1899.
xMortenson, Carl W.	IIIa	Paymaster, Talbot Mills, No. Billerica, Mass.
*Mozley, Arthur	VI	
Myers, James W.	IIIa-IV	Clerk, U. S. Bunting Co., Lowell, Mass.

Name	Course	Occupation
xNicholson, Richard	I Ib	Section Hand, Washington Mills, Lawrence, Mass.
xNoonan, Denis T.	IIIa	Assistant Superintendent, Knoxville Woolen Mills, Knoxville, Tenn.
xPalmer, G. Buel	IIIa	Melrose, Mass.
Rockwell, Henry D.	IIa	Clerk, Davis and Furber Machine Co., No. Andover, Mass.
xSchofield, John S.	IIIa	Assistant Superintendent and Designer, Lawrence Keegan Mill, Wilsonville, Conn.
Schoon, Fenton	I Ib	Section Hand, Worsted Drawing, Farr Alpaca Co., Holyoke, Mass.
Stokham, Burton I.	IV	Chemist, Bigelow Carpet Company, Lowell, Mass.
xTonge, Matthew	IIIa	Weaver, Dartmouth Mfg. Co., New Bedford, Mass.
Upton, Frank A.	I	Assistant Superintendent, Renfrew Mfg. Co., Adams, Mass.
Varney, Manley H.	I	See Evening, 1902.
Walker, David	P. G. IIIa	See Evening, 1902.

Day Course, 1904

Diploma Graduates

Abbott, Edward M.	II	Vice-President and Agent, Abbott Worsted Co., Graniteville, Mass.
Baldwin, Frederick A.	II	Baldwin's Limited, Sherbrooke, P. Q., Canada.
Clapp, F. Austin	II	Salesman, Dunmore Worsted Co., New York City.
Clogston, Raymond B.	IV	Overseer of Dyeing, Arnold Print Works, No. Adams, Mass.
Culver, Ralph F.	IV	Superintendent, Holliston Mills, Norwood, Mass.
xCutler, Benj. W., Jr.	III	With W. H. Hinchman and Co., New York City.
Dewey, James F.	II	Superintendent, Dewey's Mills, Quechee, Vt.
Donald, Albert E.	II	Assistant Superintendent, Uxbridge Worsted Co., Uxbridge, Mass.
Jury, Alfred E.	IV	Chemist, Wells and Richardson Company, Burlington, Vt.
Lucey, Edmund A.	II	Industrial Engineer, H. L. Gantt, New York City.
MacPherson, Wallace A.	III	First Assistant Designer, National & Providence Worsted Mills, Providence, R. I.
Meadows, William R.	I	Lowndesboro, Ala.
Stevens, Dexter	I	Superintendent of Yarn Dept., Lancaster Mills, Clinton, Mass.
Webb, Frank H.	IV	Chemist, Washington Mills, Lawrence, Mass.
White, Royal P.	II	Superintendent, Stirling Mills, Lowell, Mass.

Certificate Holders

Name	Course	Occupation
Halsell, Elam R.	I	Overseer of Carding, Warren Mfg. Co., West Warren, Mass.
Horsfall, George G.	II-III-V	Assistant Dyer, Kilbourne Knitting Machine Co., Martinsburg, W. Va.
xJones, Everett A.	III	Superintendent, Nye and Wait Carpet Co., Auburn, N. Y.
xO'Donnell, John D.	I-V	Clerk, Travers Bros. Co., New York City.
xO'Hara, Wm. F.	IV	Chemist, Arthur Merritt, Boston, Mass.
Parker, Everett N.	I-III-V	With Parker Spool and Bobbin Company, Lewiston, Me.
Smith, Ralston F.	I	Sales Manager, The Corday and Gross Co., Cleveland, Ohio.
xToovey, Sidney E.	V	Pattern Dresser and Weaver, Talbot Mills, No. Billerica, Mass.
*Wilson, Walter E. H.	I-V	

Evening Course, 1904

Certificate Holders

Adams, Michael E.	VI	Bookkeeper, Lowell Storage Warehouse Co., Lowell, Mass.
Balmforth, James H.	IIa-b	See Evening, 1903.
xBalmforth, Wm. F.	VI	No. Billerica, Mass.
xBarker, John P.	V	Peacedale, R. I.
Barrington, John A.	IV	Manager, Kalle & Co., Philadelphia, Pa.
xBoucher, John L.	VI	Lowell, Mass.
xButler, Benj. O.	VI	Lowell, Mass.
xCallahan, Patrick A.	VI	With Lower Pacific Mills, Lawrence, Mass.
Cheetham, John Joseph	I	Second Hand, Mass. Cotton Mills, Lowell, Mass.
xConley, Frederick A.	VI	Machinist, Kitson Machine Co., Lowell, Mass.
Connors, Edward F.	VI	Draftsman, Locks and Canals, Lowell, Mass.
Davis, Prentice T.	I	Clerk, Ervin E. Smith Co., Lowell, Mass.
Delmage, Edward R.	IIIa	Overseer Weaving, Thos. Kent Mfg. Co., Clifton Heights, Pa.
Dempsey, John W.	IIa	Photographer, Lowell, Mass.
xDonahue, Michael F.	VI	Boston, Mass.
Doole, George L.	VI	Weaver, U. S. Bunting Co., Lowell, Mass.
Dooley, Edward W.	VI	With Spencer and Co., Lowell, Mass.
Duggan, Francis P.	VI	Second Hand, U. S. Cartridge Co., Lowell, Mass.
Frank, Emil M.	IIIa	Instructor, Lawrence Industrial School, Lawrence, Mass.
Gaunt, Alfred C.	IIb	See Evening, 1899.
Hempel, Frank	V	Signal Dept., Boston & Maine Railroad, Lawrence, Mass.
Higgins, James A.	IIa-b	See Evening, 1903.
Hoyle, Joseph	IIb	Overseer, Drawing, Silesia Worsted Mills, No. Chelmsford, Mass.
xJeannotte, Arthur	VI	With Heinze Electric Co., Lowell, Mass.
xKershaw, Wm. E.	V	Weaver, Talbot Mills, No. Billerica, Mass.

Name	Course	Occupation
Langevin, Felix D.	VI	Assistant Superintendent, Kitson Machine Shop, Lowell, Mass.
xLord, Harry D.	IIIa	Lowell, Mass.
Lord, Wilfred	IIa	See Evening, 1901.
xMcBride, Robert G.	IIa	Mule fixer, Merrimack Woolen Mills, Lowell, Mass.
Merrill, Edwin C.	VI	Eng. Dept., City Hall, Lawrence, Mass.
Miller, Emil H.	V	Charge of Weaving Repairs, Lower Pacific Mills, Lawrence, Mass.
xMoorehouse, Thomas	VI	Electrician, Everett Mills Power Station, Lawrence, Mass.
Murphy, John H.	VI	Secretary, Board of Trade, Lowell, Mass.
Notman, Frederick W.	I	Clerk, Mass. Cotton Mills, Boston, Mass.
xPatrick, Alexander	IIIa	Omaha, Neb.
Redman, Henry S.	IIIa	Assistant Superintendent, Appleton Co., Lowell, Mass.
xReed, Foster C. K.	VI	Steam Engineer, Farwell Bleachery, Lawrence, Mass.
xRhodes, Joseph E.	V	Wire Sharpener, Mass. Mohair Plush Co., Lowell, Mass.
xRooney, George W.	I	Overseer, N. H. Spinning Mills Co., Penacook, N. H.
Shaw, James	V	Loomfixer, Lowell, Mass.
Smith, Edward	I	Overseer, Carding, Boott Mills, Lowell, Mass.
Smith, John W.	IIb	Automobile Machinist, Peerless Motor Car Company of New England, Boston, Mass.
xSterling, Walter	IIIa	New Bedford, Mass.
Stokham, Burton I.	P. G. IV	See Evening, 1903.
xTarpey, John F.	IIa	With Merrimack Mfg. Co., Lowell, Mass.
Thompson, Charles B.	VI	Clerk, B. and M. Railroad, Lowell, Mass.
Webb, Francis H.	V	With Frank E. Bassett, Lowell, Mass.

Day Course, 1905

Diploma Graduates

Adams, Henry S.	I	See Evening, 1903.
Boyd, George A.	I	Treasurer's Office, Harmony Mills, Boston, Mass.
Carr, George E.	I	Foreman, Wyoming Valley Lace Mills, Wilkesbarre, Pa.
Cole, James T.	II	Superintendent, Industrial Dept., Mass. Commission for Adult Blind, Cambridge, Mass.
xDillon, James H.	III	With Walworth Bros., Boston, Mass.
Harris, Charles E.	I	Proprietor, Harris Garage and Machine Co., Easthampton, Mass.
Hollings, James L.	I	Investigating Examiner, U. S. Appraisers Dept., New York City.
Hook, Russell W.	IV	Chemist, Arthur D. Little, Inc., Boston, Mass.
Jones, Everett A.	III	See Day, 1904.
Lewis, Walter S.	IV	Assistant Physicist, Bureau of Standards, Washington, D. C.

Name	Course	Occupation
xMcKenna, Hugh F.	IV	Chemist, United Indigo and Chemical Co., Ltd., Chelsea, Mass.
Midwood, Arnold J.	IV	Chemist, Levinstein and Company, Boston, Mass.
Moore, Everett B.	I	Manager and Buyer, Chadbourne and Moore, Chelsea, Mass.
Parker, Everett N.	I	See Day, 1904.
Thompson, Everett L.	I	Treasurer, The Direct Hosiery Co., Boston, Mass.
Warren, Philip H.	II	Superintendent, Hopeville Mfg. Co., Worcester, Mass.
Wheelock, Stanley H.	II	Superintendent, Stanley Woolen Company, Uxbridge, Mass.

Certificate Holders

Arundale, Henry B.	II-III-V	Director, Textile School, So. Manchester, Conn.
Conklin, Jennie G.	IIIb	Commercial Designer, Boston, Mass.
Curtis, William L.	II	With S. J. Wise & Co., Boston, Mass.
xHunt, Chester L.	III	Machinist, United Shoe Machinery Co., Beverly, Mass.
Lee, William H.	V	In business, Springfield, Mass.
Roberson, Pat H.	I	With James R. Roberson and Son, Cropwell, Ala.
Roberts, Carrie I.	IIIb	Designer, Lowell, Mass.
xThomas, Roland V.	I	Lowell, Mass.
Wright, Edward, Jr.	II	Sanitary Engineer, Mass. State Board of Health, Boston, Mass.

Evening Course, 1905

Certificate Holders

Bake, Herbert	III	Designer, Walworth Brothers, Lawrence, Mass.
Bastow, Henry	V	See Evening, 1903.
xBell, Frederick W.	IIa	With Mass. Mills, Lowell, Mass.
xBowie, Samuel A.	VI	Lawrence, Mass.
xBrown, James P.	IIIa	Section Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
xBryant, Ernest L.	VI	Clerk, D. B. Wilson Company, Waterbury, Conn.
xBurke, Thomas F.	I	Lowell, Mass.
Burns, Edward J.	IV	Tester, U. S. Cartridge Company, Lowell, Mass.
Burns, James E.	IV	Chemist, U. S. Cartridge Co., Lowell, Mass.
Caron, Cleophas	I	Overseer, Spinning Dept., Queen City Cotton Co., Burlington, Vt.
Collins, John A.	IIa-b	Secretary, Mutual Boiler Ins. Company, Boston, Mass.
Cook, Cheney E.	IIIa	Manager and Buyer, Winslow Bros. and Smith Company, Norwood, Mass.
xCuster, James E.	V	Lowell, Mass.
Dana, Clarence A.	VI	Draftsman, Lowell Machine Shop, Lowell, Mass.

Name	Course	Occupation
Dick, Hugo P.	IIIa	Designer, Tilton Mills, Valley Falls, R. I.
xDimlick, Benj. C.	IIIa	Signal Dept., B. & M. Railroad, South Lawrence, Mass.
Erbe, Gustave	VI	Foreman, J. L. Thomason, Mfg. Company, Waltham, Mass.
xFoster, Sherwood L.	I	With Lowell Brass Foundry, Lowell, Mass.
xFrench, Ernest J.	I	Clerk, Upper Pacific Mills, Lawrence, Mass.
xGay, Earle B.	I	Second Hand Carding, Dana Warp Mills, Westbrook, Me.
Goodchild, George	VI	See Evening, 1903.
Harder, Elmer E.	VI	Janitor, Highland School, Lowell, Mass.
Haven, George W.	IIIa	Of Blake and Stearns, Boston, Mass.
Howard, Thomas	V	Overseer, T. Martin and Bro. Mfg. Co., Lowell, Mass.
xHunt, Herbert R.	VI	Asst. Draftsman, DeLamar's Copper Refining Co., Chrome, N. J.
xHunton, Lewis G.	IV	Shipping Clerk, C. I. Hood Co., Lowell, Mass.
xKenworthy, Joseph	I	Second Hand, Boott Mills, Lowell, Mass.
Kimball, Irving D.	VI	Patent Dept., Lowell Machine Shop, Lowell, Mass.
Lamson, George F.	VI	See Day, 1900.
Linkletter, Alfred C.	VI	Linkletter, P. E. I.
xLovell, Charles E.	VI	Los Angeles, Cal.
Maguire, James H.	VI	Overseer, Lowell Machine Shop, Lowell, Mass.
Martin, John C., Jr.	IIa-b	Tailor, J. C. Martin & Sons, Lowell, Mass.
xMcManus, Hugh	V	With Middlesex Co., Lowell, Mass.
Molloy, Andrew	IIIa	See Evening, 1902.
O'Neill, Peter F.	IV	Warp Dyer, Arlington Mills, Methuen, Mass.
xOverend, John	V	Hand Dresser, Arlington Mills, Lawrence, Mass.
Redman, Henry S.	V	See Evening, 1904.
Silk, Frederick C. M.	IV	Carpet Inspector, Bigelow Carpet Co., Lowell, Mass.
xSimola, Emil J.	IIa-b	Finland.
xSkinner, Clarence W.	IIIa	With Brightwood Mfg. Co., No. Andover, Mass.
xSmith, Arthur	IIIa	Designer, Pemberton Mills, Lawrence, Mass.
Smith, George A.	IIIa	Superintendent, Tremont Worsted Co., Methuen, Mass.
xSmith, Wm. E.	IIIa	Cloth Inspector, Arlington Mills, Lawrence, Mass.
Stevens, Frank W.	VI	Assistant Engineer and Draftsman, Locks and Canals, Lowell, Mass.
Stopherd, Wm. H.	IIIa	See Evening, 1899.
Tonge, John	IV	Chemist, Garner Print Works and Bleachery, Garnerville, N. Y.
Wilde, Thomas E.	IIa	With Jeremiah Clark Machine Co., Lowell, Mass.
Wiswall, Frank T.	V	With Geo. E. Kunhardt, Lawrence, Mass.

Day Course, 1906

Diploma Graduates		
Name	Course	Occupation
Avery, Charles H.	II	With Mauger & Avery, Boston, Mass.
Bradford, Roy H.	II	Assistant Superintendent, Smith and Dove Mfg. Company, Andover, Mass.
Churchill, Charles W.	III	Vice-President and Superintendent, The Granby Elastic Web Co., Ltd., Granby, Quebec, Canada.
Cole, Edward E.	IV	Reporter, Bradstreet Co., Haverhill, Mass.
Currier, Herbert A.	I	Cotton Yarn Salesman, William Whitman & Co., New York City.
Curtis, Frank M.	I	Salesman, H. M. Bickford Co., Boston, Mass.
Fleming, Frank E.	IV	Asst. Dyer and Finisher, Goodall Worsted Co., Sanford, Me.
Gahm, George L.	II	Superintendent, French System, Wood Worsted Mills, Lawrence, Mass.
Hennigan, Arthur J.	II	New England Representative, Talbot Mills, Boston, Mass.
Swan, Guy C.	II	Student, Stanford University, Palo Alto, Cal.
Varnum, Arthur C.	II	Assistant Superintendent, Stirling Mills, Lowell, Mass.
Wightman, William H.	IV	Salesman, Farbenfabriken of Elberfeld Co., Boston, Mass.
Wood, Herbert C.	I	Instructor, Cotton Yarns, Lowell Textile School, Lowell, Mass.

Certificate Holders

Church, Charles R.	II-V	Physical Director, Y. M. C. A., Methuen, Mass.
Gillon, Sara A.	IIIb	Designer, Lowell, Mass.
Hildreth, Harold W.	II-V	Clerk, Arlington Mills, Lawrence, Mass.
xHintze, Thomas F.	I	New York City.
Kent, Clarence L.	III-V	With Metropolitan Life Insurance Company of New York, Lawrence, Mass.
Lane, John W.	I	With Everett Mills, Lawrence, Mass.
McDonnell, William H.	I-V	South Boston, Mass.
Newcomb, Guy H.	IV	Mgr. Badische Co., San Francisco, Cal.
Reynolds, Isabel H.	P. G. III-V	See Day, 1903.
Stohn, Alexander C.	III-V	Manager, C. Stohn, Hyde Park, Mass.
Woodruff, Charles B.	V	Buyer, Goodhall, Brown and Co., Birmingham, Ala.

Evening Course, 1906

Certificate Holders

Abbott, Paul W.	I	Foreman, Cadillac Motor Car Co., Detroit, Mich.
xAmiot, Louis H.	Va	American Hide and Leather Co., Lowell, Mass.
Armstrong, Elias B.	IIb	With Wellington, Sears & Co., Boston, Mass.

Name	Course	Occupation
Bake, Herbert	P. G. IIIa	See Evening, 1905.
xBrouder, John J.	IIIa	Designer, Ayer Mills, Lawrence, Mass.
Brown, James P.	P. G. IIIa	See Evening, 1905.
Brown, Wm. G.	IIb	President, Geo. C. Moore Wool Scouring Mills and Brookside Worsted Mills, No. Chelmsford, Mass.
xBurgess, Joseph H.	Va	Pattern Weaver, Ayer Mills, Lawrence, Mass.
Burnham, Joseph W.	IIIa	Designer, Lincoln Mills, Pascoag, R. I.
Burnham, Wilmont V.	Vb	Weaver, Wood Worsted Mills, Lawrence, Mass.
Dick, Hugo P.	P. G. IIIa	See Evening, 1905.
xDickson, Andrew	IIa	Asst. Shipping Clerk, Coronet Worsted Co., Mapleville, R. I.
Dimlick, Benj. C.	P. G. IIIa	See Evening, 1905.
Dodge, Frank	I	Overseer, Hamilton Co., Lowell, Mass.
Duce, Benjamin	IIIa	Overseer, Weaving, Ayer Mills, Lawrence, Mass.
Ellis, George W.	VII	Superintendent, A. D. Ellis & Sons, Mqns-son, Mass.
Eyers, John T.	IV	Second Hand, Dyehouse, Bay State Mills, Lowell, Mass.
Frank, Emil M.	P. G. IIIa	See Evening, 1904.
xFulton, John M.	V	Lowell Bleachery, Lowell, Mass.
Gregson, Robert B.	Va	Foreman, American Optical Co., South-bridge, Mass.
xHaigh, Wm.	Vb	Boott Mills, Lowell, Mass.
Hartwell, Henry E.	VI	Assistant Chief Engineer, Washington Mills, Lawrence, Mass.
Hoessler, Carl, Jr.	IIIa	Overseer, Weaving, M. T. Stevens & Son, No. Andover, Mass.
Howard, John	IIa	See Evening, 1900.
xHutton, Harold	V	With N. E. Bunting Co., Lowell, Mass.
xHutton, John M.	Vb	With N. E. Bunting Co., Lowell, Mass.
xInberg, Magnus	I	Fitchburg, Mass.
Johnson, Ernest A.	V	See Evening, 1902.
xKidd, Thomas E.	IV	Boston, Mass.
xLaffert, August W.	IIIa	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Maguire, James H.	I	See Evening, 1905.
xMcCarthy, Joseph F.	IIIa	Cloth Examiner, Wool Worsted Mills, Lawrence, Mass.
McLaughlin, Peter J.	I	General Second Hand, Mass. Cotton Mills, Lowell, Mass.
xMcLay, John	Vb	Clerk, Washington Mills, Lawrence, Mass.
Micheltmore, Harry	IIIa	Asst. Designer, Brightwood Mfg. Co., No. Andover, Mass.
Molloy, Andrew	P. G. IIIa	See Evening, 1902.
Morton, Albert N.	IIb	At Lowell Machine Shop, Lowell, Mass.
xMurphy, Cornelius D.	IIa	Second Hand, N. E. Bunting Co., Lowell, Mass.
Nelson, Ernest H.	IIIa	See Evening, 1900.
O'Brien, David A.	I	Manager, Hall & Lyon Co., Holyoke, Mass.
xPedler, Wm. A.	I	Clerk, Arlington Mills, Lawrence, Mass.
Pihl, Christian E.	VI	Master Mechanic, Appleton Mills, Lowell, Mass.

Name	Course	Occupation
xPittendreigh, John M.	I	Third Hand, Merrimack Mill, Lowell, Mass.
Reardon, Timothy H.	VI	Machinist, Lowell, Mass.
Reynolds, Eugene A.	VI	With Lawrence Mfg. Co., Lowell, Mass.
xRichards, Francis G.	IIa	Wool Sorter, Arlington Mills, Lawrence, Mass.
xRushworth, Walter	VI	Electrician, Bryant & Co., Cambridge, Mass.
Schubert, George J.	V	Second Hand, Pemberton Co., Lawrence, Mass.
xSenior, George	Va	Seattle, Wash.
Sharpe, John R.	VI	Overseer, Lowell Machine Shop, Lowell, Mass.
xSheppard, Byron H.	VI	Draftsman, C. R. Makepeace and Company, Providence, R. I.
xSilk, Patrick E.	VII	Second Hand, Finishing, Beaver Brook Mills, Collinsville, Mass.
Skinner, Clarence W.	P. G. IIIa	See Evening, 1905.
Smith, Arthur	P. G. IIIa Va	See Evening, 1905.
Smith, George A.	P. G. IIIa	See Evening, 1905.
Smith, Wm. E.	P. G. IIIa	See Evening, 1905.
Stopherd, Wm. H.	P. G. IIIa	See Evening, 1899.
xVogt, Harry A.	Vb	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
xWalker, Wm., Jr.	VII	Assistant to Superintendent, Ottaqueeche Woolen Co., No. Hartland, Vt.
xWard, James J.	VII	With U. S. Bunting Co., Lowell, Mass.
*Whitcomb, Harry E.	I	

Day Course, 1907

Diploma Graduates

Arundale, Henry B.	II	See Day, 1905.
Coman, James G.	I	Director, Mississippi Textile School, Agricultural College, Miss.
xCraig, Albert W.	IV	Color Chemist, Arthur Merritt, Boston, Mass.
Farmer, Chester J.	IV	Assistant Instructor, Department Biological Chemistry, Harvard Medical School, Boston, Mass.
xHaskell, Spencer H.	II	Worcester, Mass.
Hathorn, George W.	IV	Chemist, Lawrence Gas Co., Lawrence, Mass.
Hildreth, Harold W.	II	See Day, 1906.
Hoyt, Charles W. H.	IV	Second Hand, Dyeing, Merrimack Mfg. Co., Lowell, Mass.
Knowland, Daniel P.	IV	Chemist, Geigy-ter-Meer, New York City.
Mackay, Stewart	III	Instructor, Hand Loom Weaving, Lowell Textile School, Lowell, Mass.
Merriman, Earl C.	II	With Samson Cordage Works, Shirley, Mass.
xRaymond, Charles A.	IV	Chemist, N. E. Gas and Coke Company, Everett, Mass.

Name	Course	Occupation
xStorer, Francis E.	II	Clerk, National Shawmut Bank, Boston, Mass.
Stursberg, Paul W.	II	Superintendent, Worsted Yarn Dept., Germania Mills, Holyoke, Mass.
Woodcock, Eugene C.	II	Instructor, Woolen Yarns, Lowell Textile School, Lowell, Mass.

Certificate Holders

xBrannen, Leon V.	III-V	Philadelphia, Pa.
Ehrenfried, Jacob B.	II-V	With George Ehrenfried Co., Lewiston, Me.
Lane, John W.	I-V	See Day, 1906.
Parker, Mrs. Lotta (Meek)	IIIb	Lewiston, Me.

Evening Course, 1907

Certificate Holders

xAckroyd, Theodore C.	I Ib	Chicago, Ill.
Bain, William A.	VII	Color Chemist, Bischoff & Co., New York City.
Bake, Herbert	VII	See Evening, 1905.
Ballinger, Frederick W.	I Ib	Second Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
xBarber, James E.	I Ib	Combing Fixer, Silesia Worsted Mills, No. Chelmsford, Mass.
xBarraclough, John C.	I	Clerk, Arlington Mills, Lawrence, Mass.
xBastow, Stephen W.	IV	Second Hand, Dyehouse, Nashua Mfg Co., Nashua, N. H.
Bayard, Pierre P.	IIIa	Treasurer, Cie Parisienne de Roues, Put eaux, France.
Begen, Thomas W.	I Ib	Overseer, Washington Mills, Lawrence, Mass.
Benoit, William A.	Va	Second Hand, Everett Mills, Lawrence, Mass.
xBouille, Arthur L.	Vb	Washington Mills, Lawrence, Mass.
Brannen, Leon V.	IIa	See Day, 1907.
Brouder, John J.	VII	See Evening, 1906.
Bucklitsch, Gustave J.	I Ib	Overseer of Combing, Valley Worsted Mills, Providence, R. I.
Burgess, Joseph H.	Vb	See Evening, 1906.
Butterworth, Charles A.	Va	Clerk, Lawrence Mfg. Co., Lowell, Mass.
xButterworth, John A.	I Ib	Section Hand, Washington Mills, Lawrence, Mass.
Carden, Francis E.	I Ib	Lowell, Mass.
Carlson, Ernest B.	I Ib	Overseer, Bigelow Carpet Co., Clinton, Mass.
Dick, Hugo P.	I Ib	See Evening, 1905.
Dobbs, William	I Ib	Second Hand, Mass. Mohair Plush Co., Lowell, Mass.
Dodge, Charles P.	IIa	Machinist, C. S. Dodge, Lowell, Mass.
Duce, Benjamin	VII	See Evening, 1906.
Flint, Leon G.	IIIa	Percher, Washington Mills, Lawrence, Mass.

Name	Course	Occupation
Frechette, Alphonse J.	I Ib	Clerk, W. Gendron, Lawrence, Mass.
xGillespie, James E.	VII	Wet Finishing, Brightwood Mfg. Company, No. Andover, Mass.
Gregson, Robert B.	I-Vc	See Evening, 1906.
Haartz, John C.	VII	Of W. A. and J. C. Haartz, Boston, Mass.
xHaas, Ignatius	I	New York City.
Hamblett, Harry A.	I	Overseer, Merrimack Mfg. Co., Lowell, Mass.
xHanglin, Albert J.	IV	Lowell, Mass.
xHanglin, William E.	Vb	Worcester, Mass.
Hebert, Charles L. J.	IV	In business, Lowell, Mass.
Hitchen, Harry S.	Vb	Bay State Mills, Lowell, Mass.
Hitchen, Thomas G.	Vb	Manchester, N. H.
Howard, John	VII	See Evening, 1900.
xIgnatius, Pentti	Va	Appleton Co., Lowell, Mass.
Jepson, Harry	Vb	With U. S. Bunting Co., Lowell, Mass.
Kelly, Michael H.	IIIa	See Evening, 1902.
Kirsch, Alfred O.	Vb	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Laffert, August W.	VII	See Evening, 1906.
xLake, William F.	IIIa	Assistant Superintendent, Peerless Woolen Co., Rossville, Ga.
xMarjerison, T. Sydney	IIIa	Clerk, Lower Pacific Mills, Lawrence, Mass.
Martin, Willard E.	IIIa	Salesman, W. H. Gardner & Co., Boston, Mass.
Micheltmore, Harry	VII	See Evening, 1906.
Myers, James W.	VII	See Evening, 1903.
Nelson, Charles E.	I Ib	Second Hand, Bigelow Carpet Co., Clinton, Mass.
O'Brien, Michael F.	I Ib	Bigelow Carpet Co., Lowell, Mass.
Porter, George K., Jr.	IIIa	Salesman, Wellington, Sears & Co., Boston, Mass.
xRead, Paul A.	VII	Superintendent, Barnaby Mfg. Co., Fall River, Mass.
Redman, Henry S.	I	See Evening, 1904.
Ritter, Alfred E.	I Ib	With Geo. H. Hadley & Co., Lawrence, Mass.
xRobbins, John	I Ib	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Senior, George	I-Vc	See Evening, 1906.
Skinner, Clarence W.	VII	See Evening, 1905.
Smith, Arthur	Vc	See Evening, 1905.
Smith, Ernest B.	Vb	Warp Dresser, Multnomah Mohair Mills, Portland, Oreg.
xSmith, James	Vb	Loom Fixer, Wood Worsted Mills, Lawrence, Mass.
xSmith, Percy H.	Vb	Washington Mills, Lawrence, Mass.
Smith, William E.	VII	See Evening, 1905.
Varnum, Arthur C.	Vb	See Day, 1906.
xWahlberg, Einar S.	I	Fitchburg, Mass.
Waterworth, Frank W.	Vb	Overseer, Ayer Mill, Lawrence, Mass.
Webb, Francis H.	IIIa	See Evening, 1904.
xWebber, John F.	IIIa	Style Man, Converting Dept., Marshall Field & Co., Chicago, Ill.
xWhittaker, Thomas B.	I Ib	Clerk, Arlington Mills, Lawrence, Mass.

Name	Course	Occupation
Wiggin, Leon M.	IIIa	Designer, U. S. Bunting Co., Lowell, Mass.
xWolf, William C.	Va	Loom Fixer, Pacific Mills, Lawrence, Mass.
xWolger, John J.	IIIa	Loom Fixer, Methuen Co., Methuen, Mass.
xYare, John F.	Vb	Middlesex Co., Lowell, Mass.

Day Course, 1908

Diploma Graduates

Abbott, George R.	II	Andover, Mass.
Ballard, Horace W. C. S.	IV	Chemist, Kalle & Co., New York City.
Dwight, John F., Jr.	II	Cochituate, Mass.
Farr, Leonard S.	II	Overseer, Farr Alpaca Co., Holyoke, Mass.
Gay, Olin D.	II	Assistant Superintendent, Gay Bros. Co., Cavendish, Vt.
Hadley, Walter E.	IV	Instructor in Chemistry, Lowell Textile School, Lowell, Mass.
xHuising, Geronimo H.	I	Assistant Textile Appraiser, Bureau of Customs, Manila, P. I.
Jenckes, Leland A.	VI	Assistant Master Mechanic, Dwight Mfg. Co., Chicopee, Mass.
Lewis, LeRoy C.	IV	Silk Boiler, Champlain Silk Mills, Whitehall, N. Y.
Mailey, Howard T.	II	Overseer, French Drawing, Monomac Spinning Co., Lawrence, Mass.
Perkins, Joshua D.	III	With Amoskeag Mfg. Co., Manchester, N. H.
xPrince, Sylvanus C.	VI	Lowell, Mass.
Proctor, Braman	IV	Salesman, Badische Co., Boston, Mass.
Reynolds, Fred B.	II	Clerk, M. T. Stevens and Sons Co., No. Andover, Mass.
Robinson, Ernest W.	IV	Overseer, Belding Bros. & Co., Rockville, Conn.
Weinz, W. Elliot	IV	Chemist, American Felt Co., Boston, Mass.
Wingate, William H.	IV	Chemist, Sidney Blumenthal and Co., Shelton, Conn.

Evening Course, 1908

Certificate Holders

Arnold, Warren H.	VII	Second Hand, U. S. Bunting Co., Lowell, Mass.
xBarrington, James L.	IV	Color Chemist, Kalle and Co., New York City.
Begen, Thomas W.	IIb	See Evening, 1907.
Berry, Alfred H.	VI	Electrical Engineer, Silesia Worsted Mills, No. Chelmsford, Mass.
xBroadbent, James H.	Vb	With U. S. Bunting Co., Lowell, Mass.
Broadbent, William	Vb	With Merrimack Print Works, Lowell, Mass.
xBrown, James T.	IIIa	Lawrence, Mass.
Buckley, Harry	IV	Overseer, Warp Dyeing, Arlington Mills, Lawrence, Mass.

Name	Course	Occupation
Campbell, Archibald	IV	Laboratory Assistant, United Drug Laboratories Co., Dorchester, Mass.
Carden, Francis E.	IIb	See Evening, 1907.
xCarney, William J.	I	Section Hand, Arlington Mills, Lawrence, Mass.
xCarter, Charles R.	Vb	Weaver, Washington Mills, Lawrence, Mass.
xCorr, Eben W.	Vb	With Prudential Life Ins. Co., Lawrence, Mass.
Corr, James F.	Vb	Loomfixer, Bay State Mills, Lowell, Mass.
xCraven, Harry	VII	Clerk, Arlington Mills, Lawrence, Mass.
Dick, Hugo P.	Vb	See Evening, 1905.
Dixon, Arthur	IIIa	Loomfixer, American Woolen Co., Methuen, Mass.
Dobbs, William	IIb	See Evening, 1907.
Dunn, George C.	IIIa	Second Hand, Dyehouse, Tremont and Suffolk Mills, Lowell, Mass.
Flynn, William J.	Vb	Lowell, Mass.
xGreenhalge, James	Vc	Lowell, Mass.
xHallbauer, William R.	Vb	At Washington Mills, Lawrence, Mass.
Hanson, Edward	IIIa	Overseer, Merrimack Mfg. Co., Lowell, Mass.
Hardman, David B.	IV	Machine Printer, Pacific Mills, Lawrence, Mass.
xHarris, Louis	VII	Assistant to Clothing Designer, J. Peavy and Bros., Boston, Mass.
xHennessey, Ambrose M.	VII	At Talbot Mills, No. Billerica, Mass.
xHill, Harold	I	Section Hand, Arlington Mills, Lawrence, Mass.
xHoellrich, Martin J.	Vb	With Wood Worsted Mills, Lawrence, Mass.
xIngham, Benjamin W.	I	Section Hand, Boott Mills, Lowell, Mass.
xLagerbald, Jarl	VII	Asst. Chemist, Wood Worsted Mills, Lawrence, Mass.
Lake, William F.	P. G. IIIa	See Evening, 1907.
Maker, Isaac A.	I	Draftsman, Lowell Machine Shop, Lowell, Mass.
Marjerison, T. Sydney	P. G. IIIa	See Evening, 1907.
xMarshall, Fred K. R.	VI	Electrician, Arlington Mills, Lawrence, Mass.
xMcGill, William E.	VII	Second Hand, Worcester Woolen Co., Worcester, Mass.
xMcGovern, James	VII	Cloth Inspector, Arlington Mills, Lawrence, Mass.
McKenna, Jeremiah J.	Vb	With Merrimack Woolen Co., Dracut Mass.
Mortenson, Carl W.	IIa	See Evening, 1903.
Nutter, James R.	VI	With Merrimack Mfg. Co., Lowell, Mass.
*Osbeck, William J.	IIIa	
xPatterson, Alfred H.	IIIa	Clerk, Lower Pacific Mills, Lawrence, Mass.
xPerkins, Thomas, Jr.	I	Assistant Superintendent, Tremont and Suffolk Mills, Lowell, Mass.
xPicken, William	IIIa	Purchasing Agent, Silesia Worsted Mills, No. Chelmsford, Mass.
Plumer, Paul T.	Vb	Pattern Weaver, U. S. Bunting Co., Lowell, Mass.

Name	Course	Occupation
Porter, George K., Jr.	P. G. IIIa	See Evening, 1907.
Preble, George A.	IIIa	Second Hand, Mass. Cotton Mills, Lowell, Mass.
xSaalfrank, Joseph C.	IIIa	Design Dept., Arlington Mills, Lawrence, Mass.
Scally, Edward	VI	With Wm. Scally, Lowell, Mass.
Schermerhorn, George E.	Va	See Evening, 1902.
xSchuster, William F.	VII	Second Hand, Washington Mills, Lawrence, Mass.
Seddon, N. Graham	IIIa	Superintendent, Einstein Mfg. Co., Brooklyn, N. Y.
Semple, Alexander	IIIa	Clerk, Hamilton Mfg. Company, Lowell, Mass.
Shackleton, J. Henry	IV	Overseer, Dyeing, Pemberton Mills, Lawrence, Mass.
xSimoneau, Verner W.	VI	Machinist, Upton and Gilman, Lowell, Mass.
Spurr, Albert R.	VII	Assistant Finisher, Lower Pacific Mills, Lawrence, Mass.
Spurr, James H., Jr.	IV	Assistant Bacteriologist, State Board of Health Experimental Station, Lawrence, Mass.
xStewart, Charles	Va	Weaver, Tremont and Suffolk Mills, Lowell, Mass.
Teichmann, Alfred A.	Vb	Lawrence, Mass.
Tucker, John T.	I	Clerk, Kitson Machine Shop, Lowell, Mass.
Varnum, Arthur C.	P. G. IIIa	See Day, 1906.
Webber, John F.	P. G. IIIa	See Evening, 1907.
Whittaker, Thomas	IIb	See Evening, 1907.
Wiggin, Leon M.	P. G. IIIa	See Evening, 1907.
xWillgeroth, Henry J.	IIIa	Asst. Designer, Wood Worsted Mills, Lawrence, Mass.
Wilmot, Joseph	IIIa	Instructor, Weaving Dept., Lowell Textile School, Lowell, Mass.
Wolf, William C.	Vb	See Evening, 1907.
Wood, Jonathan	Va	See Evening, 1902.
xYoung, Richard, Jr.	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.

Day Course, 1909

Diploma Graduates

Brainerd, Arthur T.	IV	Salesman, H. A. Metz, New York City.
Conant, Harold W.	I	With Conant, Houghton & Co., Littleton, Mass.
Fairbanks, Almonte H.	II	Travelling Salesman, American Felt Co., Chicago, Ill.
Ferguson, William G.	III	Cost Accountant, Ludlow Mfg. Associates, Ludlow, Mass.
Fiske, Starr H.	II	Instructor, Weaving Dept., Lowell Textile School, Lowell, Mass.
Gyzander, Arne K.	IV	Overseer of Bleaching, Union Wadding Co., Pawtucket, R. I.
Holden, Francis C.	IV	With Bigelow Carpet Co., Clinton, Mass.

Name	Course	Occupation
Kay, Harry P.	II	Foreman of Finishing, Robinson Mfg. Co., Oxford, Me.
Laughlin, James K.	III	With Winslow Bros. and Smith Co., Norwood, Mass.
Levi, Alfred S.	IV	Assistant Superintendent, Liondale Bleach, Dye and Print Works, Rockaway, N. J.
Mason, Archibald L.	VI	Foreman, Champlain Silk Mills, Brooklyn, N. Y.
Mullen, Arthur T.	II	Assistant Designer, Sutton's Mills, No. Andover, Mass.
Newall, J. Douglas	IV	Second Hand, Dyehouse, Pacific Mills, Lawrence, Mass.
Parkis, William L.	I	With Sharp Mfg. Co., New Bedford, Mass.
Pease, Chester C.	I	Cost Finder, Whitman Mills, New Bedford, Mass.
Potter, Carl H.	I	Industrial Engineer, H. L. Gantt, New York City.
Prescott, Walker F.	IV	With American Felt Co., Boston, Mass.
Saunders, Harold F.	IV	Chemist, Pacific Mills, Lawrence, Mass.
Stone, Ira A.	IV	Buyer, Royal Waste Co., Boston, Mass.
Wood, J. Carleton	IV	Second Hand, Dye House, New York Mills Bleachery, New York Mills, N. Y.

Evening Course, 1909

Certificate Holders

xAnderson, Carl A.	IV	Machinist, General Electric Co., Lynn, Mass.
Arnold, Warren H.	IIIa	See Evening, 1908.
xBailey, Rothwell	Va	With Mass. Cotton Mills, Lowell, Mass.
Bake, Herbert	P. G. IIIa	See Evening, 1905.
xBanks, Jonas	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Barr, Mrs. John E. (Butler, Elizabeth M.)	IIIb	Lowell, Mass.
Benoit, Benjamin L.	Vib	Clerk, Lowell Weaving Co., Lowell, Mass.
xBooth, Arthur	IIIa	Clerk, Arlington Mills, Lawrence, Mass.
Bowen, Herbert E.	IIIa	Overseer, Middlesex Co., Lowell, Mass.
Buckley, Richard A.	Vb	With U. S. Bunting Co., Lowell, Mass.
xBunce, Raymond H.	Vb	With Bay State Mills, Lowell, Mass.
Carman, William	Va	Lowell, Mass.
Chesworth, Frank K.	Va	With Everett Mills, Lawrence, Mass.
xCockell, Frederick H.	IIIa	Loomfixer, Washington Mills, Lawrence, Mass.
Cowdrey, Charles E.	Vb	See Evening, 1902.
xDavison, Frank L.	Vb	With Talbot Mills, No. Billerica, Mass.
Dulligan, Charles E.	VIa	Overseer, U. S. Cartridge Co., Lowell, Mass.
Dunning, Carlos W.	Vib	With Appleton Co., Lowell, Mass.
Gaunt, Ernest H.	IIIa	Woolen Manufacturer, Tremont Worsted Co., Methuen, Mass.
Gilinson, Philip J.	VIa	Experimental Work, Heinze Electric Co., Lowell, Mass.
xGordon, Herbert E.	IIIa	Clerk, Arlington Mills, Lawrence, Mass.
Hanson, Edward	P. G. IIIa	See Evening, 1908.

Name	Course	Occupation
xHayes, Michael C.	IIa	With Talbot Mills, No. Billerica, Mass.
Hill, Harold	Va	See Evening, 1908.
Hillier, Arthur P.	IIb	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Hodgkins, Albert A.	VII	Designer, Narrow Fabric Corporation, New Haven, Conn.
Holt, Harry C.	VIa	Electrician, Mass. Cotton Mills, Lowell, Mass.
xHouston, William I.	IIIa	Weaver, Washington Mills, Lawrence, Mass.
xHowell, Edward A.	Va	Loomfixer, Pemberton Mills, Lawrence Mass.
xJoyce, John	Vc	Weaver, Merrimack Mfg. Company, Lowell, Mass.
Kaler, Harold F.	VIb	Tester, Heinze Electric Co., Lowell, Mass.
Kelley, Bernard J., Jr.	VIc	With P. J. O'Hearn, Lowell, Mass.
Kershaw, Benn	Va	Second Hand, Tremont & Suffolk Mfg. Co., Lowell, Mass.
Lincourt, Henry E.	VIb	With Stover & Bean, Lowell, Mass.
Madden, Peter	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
xMahoney, Dennis J.	Vb	With Talbot Mills, No. Billerica, Mass.
McClure, Charles G.	VIb	With Heinze Electric Co., Lowell, Mass.
McLay, John	IIb	See Evening, 1906.
Molloy, Andrew	P. G. IIIa	See Evening, 1902.
Musard, Albert E., Jr.	Vc	With Beaver Brook Mills, Collinsville, Mass.
Nelson, Ernest H.	I	See Evening, 1900.
Orrell, Frank L.	VIb	Section Hand, Mass. Mohair Plush Co., Lowell, Mass.
Palmer, G. Buel	Vb	See Evening, 1903.
xPaquin, Joseph	VIa	Detroit, Mich.
Parsons, Joseph G.	IIIa	Pattern Weaver, Thos. Kitson & Son, Stroudsburg, Pa.
xPearson, Fred	VIa	Machinist, Lowell Machine Shop, Lowell, Mass.
Read, Paul A.	Va	See Evening, 1907.
Robinson, Thomas	I	Mule Spinner, Boott Cotton Mills, Lowell, Mass.
Ryan, Edward P.	I	Overseer, Tremont and Suffolk Mills, Lowell, Mass.
Schubert, George J.	IIIa	See Evening, 1906.
Schuerfeld, Harry W.	IIIa	Salesman, C. U. Thomas and Co., Boston, Mass.
Smith, Arthur	P. G. IIIa	See Evening, 1905.
Smith, George A.	VII	See Evening, 1905.
Smith, William E.	P. G. IIIa	See Evening, 1905.
Stocks, Carl W.	VIa	Statistician, American Electric Railway Assn., New York City.
Stopherd, William H.	P. G. IIIa	See Evening, 1899.
*Sullivan, Humphrey F.	I	
Sykes, Alvin E.	VIa	Shipping Clerk, Lowell Machine Shop, Lowell, Mass.
Tucker, John T.	Va	See Evening, 1908.
Varnum, Arthur C.	VII	See Day, 1906.
Vogt, Alfred H.	IIb	See Evening, 1902.

Name	Course	Occupation
Walsh, Michael L.	I	Section Hand, Appleton Co., Lowell, Mass.
Ware, Edward W.	IIIa	With Wellington, Sears & Co., Boston, Mass.
Watson, Luther F.	I Ib	Clerk, Arlington Mills, Lawrence, Mass.
xWeigel, Frederick A.	VIb	Machinist, Everett Mills, Lawrence, Mass.
Young, Richard, Jr.	Vc	See Evening, 1908.

Day Course, 1910

Diploma Graduates

Arienti, Peter J.	IV	Chemist, Wanskuck Co., Providence, R. I.
Cary, Julian C.	VI	Draftsman, Merrimack Mfg. Co., Lowell, Mass.
Clark, Thomas T.	II	With Talbot Mills, No. Billerica, Mass.
Duval, Joseph E.	II	Assistant to Superintendent, Mass. Mohair Plush Co., Lowell, Mass.
Finlay, Harry F.	IV	Color Chemist, American Dyewood Co., Boston, Mass.
Fletcher, Roland H.	VI	Draftsman, Laconia Car Co., Laconia, N. H.
Gale, Harry L.	III	Designer, West, Baker & Co., New York City
Goldberg, George	VI	Draftsman, Boston Woven Hose & Rubber Co., Cambridge, Mass.
Hardy, Philip L.	VI	With L. E. Locke, South Lawrence, Mass.
Howe, Woodbury K.	I	Cost Finding, Anchor Webbing Co., Woonsocket, R. I.
Hurtado, Leopoldo, Jr.	VI	General Manager, Hurtado and Co., Uruapan, Mich., Mexico.
Jelleme, William O.	I	Investigator, Brighton Mills, Passaic, N. J.
Keough, Wesley L.	II	Assistant Dyer, Mass. Mohair Plush Co., Lowell, Mass.
Lamb, Arthur F.	II	With American Felt Co., Picton, N. J.
Manning, Frederick D.	IV	Second Hand, Dyehouse, Appleton Co., Lowell, Mass.
McCool, Frank L.	IV	Second Hand, Dyehouse, Dana Warp Mills, Westbrook, Me.
Murray, James A.	II	Foreman, McCullar, Parker Co., Boston, Mass.
Nichols, Raymond E.	VI	Draftsman, Lowell Bleachery, Lowell, Mass.
Putnam, Leverett N.	IV	Assistant Dyer, American Felt Co., Boston, Mass.
Reed, Norman B.	I	Investigator, Smith and Dove Mfg. Co., Andover, Mass.
Robson, Frederick W. C.	IV	Color Chemist, United Indigo and Chemical Co., Boston, Mass.
Smith, Doane W.	II	With Somerset Woolen Co., Monson, Mass.
Smith, Theophilus G., Jr.	IV	Groton, Mass.
Stronach, Irving N.	IV	Assistant Dyer, Aberfoyle Mfg. Co., Chester, Pa.
Whitcomb, Roscoe M.	IV	Springfield, Vt.

Evening Course, 1910

Name	Certificate Holders	
	Course	Occupation
Anderton, Harry	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Atkinson, Norman	Vb	With Bay State Mills, Lowell, Mass.
xBailey, Carl E.	I	Knoxville, Tenn.
Banks, Jonas	Vc	See Evening, 1909.
Berry, Percy W.	Vb	Loomfixer, Ayer Mills, Lawrence, Mass.
xBouchard, Ethan J.	Vc	Loomfixer, Merrimack Mfg. Co., Lowell, Mass.
xBourchard, Robert R.	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Burgess, Joseph H.	IIIa	See Evening, 1906.
Campbell, Edward G.	VIc	Draftsman, Millard F. Davis, Lowell, Mass.
Christison, Hugh	IV	Chemist's Assistant, Arlington Mills, Lawrence, Mass.
Cox, Edward J.	IIIa	Cost Finder, Merrimack Mfg. Co., Lowell, Mass.
Cutress, Albert J.	VIId	Machinist, Lowell Machine Shop, Lowell, Mass.
xDeely, John A.	Vb	Pittsfield, Mass.
xDuckett, Fred I.	Vb	Section Hand, Washington Mills, Lawrence, Mass.
Dulligan, Lawrence F.	VIa	Machinist, Auto Fire Vulcanizing Co., Lowell, Mass.
Dunn, George C.	IVa	See Evening, 1908.
xEklund, Louis V.	Vb	With Merrimack Woolen Co., Dracut, Mass.
Fleming, Fred	Vc	With Merrimack Mfg. Co., Lowell, Mass.
Flemings, Lester A.	Va	Clerk, Lowell Weaving Co., Lowell, Mass.
xFlynn, John	VIId	Toolmaker, Kitson Machine Shop, Lowell, Mass.
xFlynn, Patrick	Vb	With Bay State Mills, Lowell, Mass.
Fujiyoshi, Heisayu	I	Student, Lowell Textile School, Lowell, Mass.
Gaspar, Edith E.	IIIb	With Lawrence Hosiery, Lowell, Mass.
Gauthier, William	Vb	With Bay State Mills, Lowell, Mass.
xGookin, Alice L.	IIIb	Teacher, City of Lowell, Lowell, Mass.
Hering, Paul C.	IIIa	Loomfixer, Wood Worsted Mills, Lowell, Mass.
Hibbert, George E.	Va	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
Hill, Ellsworth O. C.	IIb	Assistant Superintendent, Yarn Dept., Wood Worsted Mills, Lawrence, Mass.
Hilliard, William B.	VIa	Foreman, American Watch Tool Co., Waltham, Mass.
Hird, Arthur W.	I	Overseer, Lawrence Mfg. Co., Lowell, Mass.
Hird, James A.	IVa	Assistant Chemist, N. Y., N. H. & H. R. R., New Haven, Conn.
Hodgkins, Albert A.	IIIa	See Evening, 1909.
Hoellrich, Martin J.	Vc	See Evening, 1908.
Holt, Gavin O.	IVa	Designer, Boott Mills, Lowell, Mass.
Houston, William I.	Vb	See Evening, 1909.
Hunton, John H.	VII	Assistant to Treasurer, Newichawanick Co., So. Berwick, Me.
Hurtado, Leopoldo, Jr.	Vc	See Day, 1910.

Name	Course	Occupation
Hutton, Thomas V.	Vb	Loomfixer, New England Bunting Co., Lowell, Mass.
Jackson, Frank	VIb	With Monomac Mills, Lawrence, Mass.
Jean, Adhemard C.	VIa	Inspector, Line Dept., Bay State Street Railway Co., Lowell, Mass.
Jordan, Frederic W.	IV	Draftsman, Smith and Brooks, Lowell, Mass.
Jorde, Linville T.	VIc	With Lawrence Mfg. Co., Lowell, Mass.
Kershaw, Benn	Vc	See Evening, 1909.
Kershaw, Samuel S.	I Ib	Section Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Krause, George	VII	Monson, Mass.
LaJeunesse, Joseph A.	IVa	Assistant Dyer, Tremont & Suffolk Mills, Lowell, Mass.
Leck, Arthur J.	VII	Analyzer of Fabrics, Earl & Wilson, Troy, N. Y.
Ledoux, Blanche H.	IIIb	With A. G. Pollard Co., Lowell, Mass.
Lemire, Arthur	I	Second Hand, Hamilton Mfg. Co., Lowell, Mass.
Mabbett, Albert L.	IIIa	Assistant Superintendent and Designer, Newport Woolen Co., Newport, Me.
Maxcy, Leo M.	VIc	Foreman, F. E. Jewett and Co., Lowell, Mass.
McAuliffe, Patrick D.	VIb	With C. B. Coburn Co., Lowell, Mass.
McElroy, Samuel H.	Vb	Cloth Examiner, Bay State Mills, Lowell, Mass.
xMessiah, Hiram G.	Vb	With G. A. Rogers Bakery, Reading, Mass.
Nelson, Ernest H.	Vc	See Evening, 1900.
Nelson, Gustave A.	Vb	With T. Martin and Bro., Lowell, Mass.
Nichols, Clarence W.	Vb	With Alfred Kimball Shoe Co., Lawrence, Mass.
Nicoll, John	IVa	With Smith and Dove Mfg. Co., Andover, Mass.
Paquin, Joseph	VIb	See Evening, 1909.
Petterson, Birger	VIa	Draftsman, Lowell Bleachery, Lowell, Mass.
Phelps, Mary I.	IIIb	Teacher, City of Lowell, Lowell, Mass.
Redman, Henry S.	IV	See Evening, 1904.
Robinson, Thomas	Vc	See Evening, 1909.
Root, Francis X., Jr.	IIIa	Loomfixer, Merrimack Mfg. Co., Lowell, Mass.
Shackleton, John H.	I	See Evening, 1908.
Stewart, William W.	IV	Overseer of Dyeing, Barnaby Mfg. Co., Fall River, Mass.
Stopherd, William H.	VII	See Evening, 1899.
Stott, Bertram S.	Vb	With Geo. E. Kunhardt, Lawrence, Mass.
Stott, Samuel	IV	Assistant Worsted Dyer, Arlington Mills, Lawrence, Mass.
Sullivan, Michael F.	VIb	With Merrimack Woolen Co., Dracut, Mass.
xTodd, Henry	VII	With Farwell Bleachery, Lawrence, Mass.
xWelch, Benjamin L.	VIb	Electrician, Wood Worsted Mills, Lawrence, Mass.
Whitman, William P.	IVa	With Bigelow Carpet Co., Lowell, Mass.
Whitney, Frederick A.	IV	Dyer, John P. Boyd Co., Williamstown, Mass.
Williams, Allen R.	I	With Hamilton Mfg. Co., Lowell, Mass.
Worthington, John A.	I	Second Hand, Merrimack Mfg. Co., Lowell, Mass.

Day Course, 1911

Diploma Graduates		
Name	Course	Occupation
Adams, Tracy A.	IV	Second Hand in Dyehouse, Pacific Mills, Dover, N. H.
Bailey, Walter J.	IV	Assistant Foreman, Lewando's Dyeing Co., Watertown, Mass.
Blaikie, Howard M.	II	Washington Mills, Lawrence, Mass.
Cameron, Elliott F.	IV	Second Hand, American Optical Co., Southbridge, Mass.
Chandler, Proctor R.	IV	Chemist, I. E. Palmer Co., Middletown, Conn.
Chisholm, Lester B.	I	Treasurer, Dartmouth Knitting Co., Melrose, Mass.
Dewey, Maurice W.	II	Montpelier, Vt.
Flynn, Thomas P.	IV	Fitchburg, Mass.
Ford, Edgar R.	IV	Bleacher, Saylesville Bleachery, Saylesville, R. I.
Gainey, Francis W.	IV	Assistant Chemist, Pacific Mills, Dover, N. H.
Hay, Ernest C.	II	With Monomac Spinning Co., So. Lawrence, Mass.
Hendrickson, Walter A.	II	With American Hosiery Co., New Britain, Conn.
Hubbard, Ralph K.	IV	With Squam Lake Woolen Co., Ashland, N. H.
Hunton, John H.	II	See Evening, 1910.
Martin, Harry W.	IV	Chemist, Hood Rubber Co., Watertown, Mass.
Merrill, Allan B.	IV	Chemist, Diamond Rubber Co., Akron, Ohio.
Moore, Karl R.	IV	With Wood Worsted Mills, Lawrence, Mass.
O'Connell, Clarence E.	IV	Second Hand in Dyehouse, Boston Mfg. Co., Waltham, Mass.
Pearson, Alfred H.	IV	Second Hand, Pacific Mills, Dover, N. H.
Rich, Everett B.	III	Hotel Accountant, Profile and Flume Hotel Co., Boston, Mass.
Sidebottom, Leon W.	IV	Assistant Chemist, Wood Worsted Mills, Lawrence, Mass.
Standish, John C.	IV	Assistant Instructor, Dyeing Dept., Lowell Textile School, Lowell, Mass.
Toshach, Reginald A.	II	Clerk, M. T. Stevens and Sons Co., Haverhill, Mass.
Walker, Alfred S.	II	Malden, Mass.
Watson, William	III	Haverhill, Mass.
Wood, Ernest H.	IV	With Brewer and Co., Worcester, Mass.

Evening Course, 1911

Certificate Holders		
xAndrews, Oliver	I-Va	Loomfixer, Boott Mills, Lowell, Mass.
Ballinger, William E.	IIb	Section Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Barnes, Joseph	I	Second Hand, Smith and Dove Mfg. Co., Andover, Mass.

Name	Course	Occupation
Bastow, Percy	IVa	Warp Bleacher, Arlington Mills, Lawrence, Mass.
Birkby, Charles H.	IVa	Overseer, Dyeing, Wallace and Smith Co., Laporte, Ind.
Brown, William F.	VIb	Master Mechanic, U. S. Worsted Co., Lowell, Mass.
Burke, James F.	Vc	With U. S. Bunting Co., Lowell, Mass.
Carpilio, John A.	VIa	With Alfred Kimball Shoe Co., So. Lawrence, Mass.
Carty, Thomas P.	Vb	With Bigelow Carpet Co., Lowell, Mass.
Christison, Hugh	IVd	See Evening, 1910.
Cochrane, John	VIb	Electrician, Lowell Gas Light Co., Lowell, Mass.
Cote, George W.	VIb	Clerk, Lowell Weaving Co., Lowell, Mass.
Cox, Edward J.	Va	See Evening, 1910.
Dean, Hubert R.	VIb	Assistant Draftsman, Arlington Mills, Lawrence, Mass.
Delaney, Michael J.	Vb	Lowell, Mass.
Dodge, Ernest W.	Vb	Lowell, Mass.
Downs, John F.	VIc	With Heinze Electric Co., Lowell, Mass.
Dulligan, Thomas	VIa	Machinist, Lowell Machine Shop, Lowell, Mass.
Flaherty, William	Vb	With U. S. Cartridge Co., Lowell, Mass.
Fournier, Albert A.	I	Second Hand, Hamilton Mfg. Co., Lowell, Mass.
Fujiyoshi, Heisayu	Va	See Evening, 1910.
Gakidis, Alexander N.	IVa	Manchester, N. H.
Garrity, Joseph F.	VIc	Machinist, Bay State Street Railway Co., Lowell, Mass.
Glennon, Edward M.	IVa	With Arlington Mills, Lawrence, Mass.
Goodwin, Ross	Vb	With U. S. Bunting Co., Lowell, Mass.
Gustafson, Alfred L.	IVa	Steamfitter, C. J. Mitchell and Co., Providence, R. I.
Handley, John M.	Vb	With Musketaquid Mills, Lowell, Mass.
Hanslip, Charles W.	Vb	Saugus, Mass.
Hartwell, Marcus H.	I-Va	With Mass. Cotton Mills, Lowell, Mass.
Heaton, Forster G.	IV	Second Hand, Dyeing Dept., Bay State Mills, Lowell, Mass.
Herrick, William E.	VII	Second Hand, Sayles and Jenks Mfg. Co., Warren, Mass.
Hibbert, George E.	Vc	See Evening, 1910.
Hodge, William	VIa	With Lower Pacific Mills, Lawrence, Mass.
Kennedy, William E.	VIa	Examiner, Arlington Mills, Lawrence, Mass.
Lachance, Melina	IIIB	With A. G. Pollard Co., Lowell, Mass.
Lemire, Arthur	Va	See Evening, 1910.
Linberg, Joseph F.	IVa	Mercerizer, Shaw Stocking Co., Lowell, Mass.
Logan, George H. S.	IV	Dyer, Lewando's Dyeing Co., Watertown, Mass.
Manning, James B.	IVa	Dyer, Beaver Brook Mills, Collinsville, Mass.
Marsden, Phillips B.	IVa	Chemist's Assistant, Arlington Mills, Lawrence, Mass.
McNamara, Thomas	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Milot, Joseph E.	VIc	With Amasa Pratt Co., Lowell, Mass.

Name	Course	Occupation
Murphy, Howard H.	IIb	Lowell, Mass.
Nelson, James A.	I	With Mass. Cotton Mills, Lowell, Mass.
Nelson, Sigfred	VId	Tool Maker, Lamson Consolidated Store Service Co., Lowell, Mass.
Newall, Preston	I	With Kosciusko Cotton Mill, Kosciusko, Miss.
Newsholme, Charles E.	VIb	Assistant Shipper, Treat Hardware and Supply Co., Methuen, Mass.
Nichol, Samuel J.	IVa	Foreman Dyer, Waterhead Mills, Lowell, Mass.
Nichols, Nathan A.	VIb	Lowell, Mass.
Parkin, Prescott R.	Vb	Boston, Mass.
Pedler, William A.	IVa	See Evening, 1906.
Perron, Francis J.	Vb	With Brightwood Mfg. Co., No. Andover, Mass.
Perry, Clarence R.	IIb	Assistant Superintendent, Washington Mills, Lawrence, Mass.
Racicot, Marie E.	IIIb	Lowell, Mass.
Robinson, James E.	VII	With Bay State Mills, Lowell, Mass.
Robinson, Ruddach P.	VII	Clerk, American Woolen Co., Lowell, Mass.
Rogers, John F.	I	Seattle, Wash.
Rowlands, Harold	Va	Clerk, Mass. Cotton Mills, Boston, Mass.
Shaffer, William A.	VId	Lowell, Mass.
Shields, John J.	Va	With Mass. Cotton Mills, Lowell, Mass.
Stanley, John R.	IIb	Machinist, Silesia Worsted Mills, No. Chelmsford, Mass.
xStearns, Orlo F.	IVa	With W. E. Adams, Chelmsford, Mass.
Stewart, George	I-IVa	Overseer of Dyeing, Mass. Cotton Mills, Lowell, Mass.
Tennant, Joseph A.	VIb	In Machine Shop, Washington Mills, Lawrence, Mass.
Wade, Frank J.	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Walton, Frank L.	I	Muscogee, Okla.
Ward, Bernard D.	IIIa	Second Hand, Hamilton Mfg. Co., Lowell, Mass.
Williams, Allen R.	Va	See Evening, 1910.
Willmott, Herbert J.	VIa	Draftsman, Locks and Canals, Lowell, Mass.
Wollin, Frederick W.	Va	Utica, N. Y.
Wright, Frederick J.	Vb	With Mears, Feeley and Adams, Lowell, Mass.

POSITIONS ATTAINED BY DAY GRADUATES 1899 - 1911

Directors of textile schools	2
Instructors, textile or industrial schools	12
Mill Vice-Presidents	2
Mill Treasurers	4
Mill Agents	4
Mill Superintendents	15
Mill Assistant Superintendents	9
Mill Foremen of Departments	14
Assistants to Superintendents	2
Mill Auditors and Accountants	7
Second Hands	9
Clerks	5
Textile Designers	16
In Commission Houses	6
Wool Houses	1
Salesmen	4
Managers	7
Chemists and Dyers	35
Chemical Salesmen	4
In United States Employ	4
In State Employ	1
Electricians	2
Industrial Engineers	5
Mill Engineering	11
Trade Journalists	3
In Business, Textile distributing or incidental thereto	6
Other Business	13
Third Hands	1
Weavers	1
Students	2
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Lowell Textile School

LOWELL, MASS.

Date

Name in Full,

Date and Place of Birth,

Home Address, {
City or Town State
.....
Street and Number

Parent or Guardian,

School last attended,

DEGREE COURSES. (Course should be indicated)
I-4 Textile Engineering II-4 Chemistry and Textile Coloring
1 General Textile Option
2 Cotton Option
3 Wool Option

DIPLOMA COURSES. (Course should be indicated)
I-3 Cotton Manufacturing IV-3 Chemistry and Dyeing
II-3 Wool Manufacturing VI-3 Textile Engineering
III-3 Textile Design
(General Textile Course)

Signature,

ENDORSEMENT BY OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that.....
the above applicant has completed the regular course at the
High School, and has satisfactorily passed the following subjects, as specified
on pages 67-79 of Catalogue of 1912-1913, making a total of..... points.

REQUIRED SUBJECTS. POINTS.

ELECTIVE SUBJECTS. POINTS.

.....
.....
.....
.....
.....

Signed :

Principal School, located
at State of

Date.....

EVENING APPLICATION BLANK

THIS SHOULD BE FILLED OUT AND SENT TO THE PRINCIPAL

Lowell Textile School

LOWELL, MASS.

DATE.....

I, hereby
apply for admission to the Lowell Textile School as *EVENING*
student.

Name in Full,

Date and Place of Birth,

Home Address, {
City or Town State
.....
Street and Number

Parent or Guardian,

Residence of Parent or Guardian,

School last attended,

(INDICATE COURSE)

I. Cotton Spinning.

- II. a—Woolen Spinning.
b—Worsted Spinning.

- III. a—Textile Design.
b—Freehand Drawing.

IV. Chemistry and Dyeing.

- a—Elementary Chemistry.
b—Textile Chemistry and Dyeing.
c—Analytical Chemistry
d—Textile and Analytical Chem-
istry.

V. Weaving.

- a—Cotton Weaving.
b—Woolen and Worsted Weaving.
c—Dobby and Jacquard Weaving.

VI. Engineering.

- a—Elements of Engineering.
b—Mechanical Drawing.
c—Machine Shop.

VII. Woolen and Worsted Finishing.

Signature,

ENDORSEMENT BY SOME OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that
the above applicant is duly qualified to pursue with profit the
work of the Lowell Textile School.

SIGNED :

Principal School, located
at State of

Date

BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

FOR BULLETIN AND TERMS ADDRESS CHARLES H. EAMES, PRINCIPAL

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PROGRESS

One of the present day watchwords may fairly be taken as "Progress" with its several derivatives such as Progression, Progressive, etc. As far as being in harmony with this spirit the Lowell Textile School was established for the purpose of assisting in the progress of the industry and to be successful must show that it is fulfilling its object by meeting the growing demands made upon it.

Its graduates in successful places are active living examples of the results of the training that the courses of instruction have produced during the few years of its existence. They have in a majority of cases shown progress.

The school to keep pace with the times and with the industry has broadened its courses and added to its equipment and instructing force. Commencing this year there will be offered four year courses to the degrees of Bachelor of Textile Engineering and Bachelor of Textile Dyeing. In the former course there are three options viz. (a) Cotton; (b) Wool; (c) Cotton and Wool, thus permitting a student to specialize in any one as he may wish to prepare himself for some particular position or field of work. The course in any case is an engineering one and it is intended that it shall include all subjects recognized as essential to the training of a Textile Engineer or a manufacturer.

The course in Textile Dyeing includes a thorough and complete course in theoretical and applied chemistry as found of service in the industry. In addition much time is given to the theory and practice of dyeing textile material both in an experimental manner and upon a large scale.

Besides these broad degree courses the school will still continue to offer the three year diploma courses as in the past. For those who wish to specialize opportunity will be offered as far as the preparation of the student will permit and schedule will allow.

In accordance with the grants of the Legislature of this year a very full line of equipment for Cotton Finishing will be installed this summer and fall. This will make it possible to carry on the manufacture of cotton fabric from the bale to the finished cloth as has been possible previously for woolen and

worsted material. To the equipment of the Engineering Department will be added some electrical machines and apparatus for testing and experimental work. More and more attention is being given by the trade to the physical as well as the chemical properties of textile fibres, yarns, and fabrics. That the school may be able to determine the value of certain physical properties, make investigations, and give instruction in this branch, considerable equipment will be installed to carry on this work.

The new power house is being completed this summer and an endeavor is being made to generate power and light as efficiently as possible. To this end and to better comply with the laws of the state concerning the prevention of smoke Mr. George H. Perkins, S. B., Head Instructor of the Engineering Department was commissioned to visit England to attend the convention of those interested in smoke prevention and to learn what steps have been taken to prevent this nuisance. His report is given herewith.

That suitable record of the commencement exercises of the class of 1912 may be made the program is included in this bulletin as is also the address of the afternoon given by Hon. Joseph Walker, ex-speaker of the House of Representatives.

COMMENCEMENT EXERCISES

DAY CLASSES

OVERTURE, "Tambo de Guarde"	<i>Tilt</i>
ORCHESTRA	
MARCH, "In Merry, Merry May"	<i>Albini</i>
ORCHESTRA	
ADDRESS	ALEXANDER G. CUMNOCK
SOLO FOR CORNET (Selected)	
BERT F. TABOR	
ADDRESS	HONORABLE JOSEPH WALKER
PRESENTATION OF THE MEDAL OF THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS	FREDERICK A. FLATHER
PRESENTATION OF THE ARLINGTON MILLS PRIZE FOR PROFICIENCY IN TEXTILE DESIGN	FRANKLIN W. HOBBS
CONCERT WALTZ, "Baden-Baden"	<i>Bousquet</i>
ORCHESTRA	
ANNOUNCEMENT OF THE AWARDS FOR PROFICIENCY IN CHEMISTRY	
PRESENTATION OF DIPLOMAS	CHARLES H. EAMES
FINALE, "The Great Divide March"	<i>Bizet</i>
ORCHESTRA	

ADDRESS OF HON. JOSEPH WALKER

at Graduation Exercises of the Lowell Textile School

FRIDAY, JUNE 7, 1912

It is said that the best product of Massachusetts soil is her men and women. This is the greatest tribute that could be paid our Commonwealth. As this has been true in the past, so I hope it will continue to be true in the future. The object of all true education is the development of men and women, not only as individuals but also as members of society.

An important function of education, and one sometimes undervalued, is, therefore, to adapt men and women to their environment, to fit them to earn a living for themselves by fitting them to serve their fellow men. Trade and technical training serve this end. True education is a very practical thing. Until a man is fitted to support himself and his family, he is of little use either to himself or to the community.

One of the glories of our Commonwealth is that she has never confined herself to the education of the few. The common school training, designed for the masses of the people, has always been the backbone and substance of education in Massachusetts. It will continue to be. Massachusetts has been as famous also for her higher institutions of learning. In the early days the emphasis was laid on religious and cultural studies. Of late the importance of technical and industrial training has been more fully recognized. The recent reorganization of our State Board of Education indicates the modern tendency. Education, like life itself, is many-sided. No side can be neglected without loss to the community.

In the new movement for vocational training first came the great technical schools, such as the Massachusetts Institute of Technology and the Worcester Polytechnic Institute, and now have come the textile schools and the various industrial schools. This new educational movement means much to the industrial development and to the future prosperity of the United States.

In my judgment no schools are doing better work than our three great textile schools here in Massachusetts. I was present at the dedication of this building in which today these graduating exercises are being held. I have spoken at the graduation exercises of the Bradford-Durfee Textile School of Fall River and of the New Bedford Textile School, and now I am especially glad to join with you in these graduation exercises. I have great interest and much faith in all these schools. I congratulate you upon what has already been accomplished by the work you are doing and I prophesy a great future for this school. You are serving not the select few, but, in your evening classes especially, you reach the great mass of ambitious textile workers. By developing their ability to serve their employers you increase their ability to serve themselves. You make them better men and better citizens.

I have been thinking much of late upon the great industrial development of this country—a development which this school is designed to promote—and of the social and industrial problems involved. We are

all proud of this development and yet let us never forget that mere industrial development is never an end in itself. The true end of all industrial development, as of civilization itself, is the mental, moral and physical development, the well-being and the happiness of the individuals who make up the mass of the people. Therefore the final test of our industrial system is whether it makes for the happiness and prosperity of the masses.

This is a city of great mills and workshops. Let us never forget that in the last analysis these mills and these workshops are for the benefit of the multitudes of people who work in them and not the people for the benefit of the few who own and manage such mills and factories. If this were not so, then indeed would our industrial system be a failure. An industrial system which does not permit the normal development of childhood into manhood and womanhood, a system which tends to destroy the bodies and crush down the minds and souls of the many, cannot long endure.

Industrial peace is essential to the prosperity and happiness both of employers and of employees. In the long run, the interests of capital and labor are the same. To harmonize these interests for the benefit of society is, therefore, essential. There can never be contentment and harmony,—there can never be industrial peace until the individual worker is assured safe and healthful conditions of employment and a living wage for a reasonable day's work. The wage workers of the Commonwealth must have a reasonable opportunity for life, liberty and the pursuit of happiness.

This great country of ours, with its vast natural resources, is capable of supporting its population in comfort. The great economic problem of the day is not one of production but rather one of more equitable distribution. An industry which cannot pay a living wage for a reasonable day's work has no right to exist. No industry is good for a community the wage scale of which is permanently sub-normal.

This fundamental problem of industrial conditions, of wages and of hours, must be worked out. If it is not so worked out as to insure a reasonably high standard of living in each industry, then, not only our industrial system but our free government itself becomes insecure. Oppressive conditions, insufficient wages and unreasonable hours of labor lead directly to discontent, to industrial wars and to socialism.

Employers must realize the situation which confronts us in time. They must feel responsibility for the living conditions of their employees. They must look upon their employees not merely as machines out of which to get work but as men and women, as citizens and as brothers.

I wish to commend to your thoughtful attention the wise words of Jonathan T. Lincoln of Fall River, spoken at the recent meeting of the National Association of Cotton Manufacturers,—“the creation of wealth is, indeed, the purpose of our industrial establishment, and to this end our modern machinery of production is admirably adapted. The object for which this wealth is produced, however, is not to make rich and powerful a few industrial overlords, but to feed and cloth humanity—that the physical body being made perfectly comfortable, men shall be able to enjoy the blessings of that freedom for which true soldiers in

the ages that have passed gave up their lives in loyal service. In the realization of this ideal we have a cause broad enough to include even the great cause of labor, a cause to which both the employer and employee may be loyal and in which both may join in a common service to mankind. For, in my belief, the labor problem in all its varied aspects will one day be solved and a higher civilization will succeed the present. I believe that the conditions of the workers of the world in the age that is approaching will be as far in advance of their condition today as our factory operatives now are in advance of the conditions of mediaeval serfdom and ancient slavery; and that this progress is to be the final result of a three-fold loyalty; first, the loyalty of the employed to the true cause of labor; second, the loyalty of the employer to the ideal that business may be made a ministry of service to the world of men; third, the loyalty of both employer and employee to the eternal cause of human freedom." Now that statement shows a breadth of view which is refreshing.

I realize the difficulties of the situation. I realize the evils in unrestricted competition. Reasonable combinations and agreements, under government regulation and control, must be permitted. The law must be made clear on this subject. As far as legislation is concerned there are always two sides to industrial problems. It is important to protect by the law the health and safety of operatives, to relieve the individual worker of the burden of industrial accident, to limit the hours of labor and generally to insure proper conditions of employment. Yet every one recognizes the fact that if Massachusetts gets too far ahead of her sister states in this matter she handicaps and may even destroy the industries upon which our people depend for their living. It is always a nice question to decide how far and how fast Massachusetts acting alone can afford to go in this direction.

Under our federal system of government and in the face of competition from other states, with longer hours and lower wages, this is a difficult problem to work out. But it must be worked out if we are to avoid that discontent and unrest which is driving this country on to socialism. If the nation had power to fix uniform hours and uniform conditions of labor throughout the country the problem would be more easy of solution. If it were not for our protection tariff we would be in unrestricted competition with the rest of the world as well.

Above all it is important to keep alive the right spirit among all our people. Today the feeling is altogether too common that men, in one way or another, are trying to take advantage of each other rather than trying to co-operate and help each other. The poor and the weak seem to feel that the rich and the powerful care nothing for them, but in the pursuit of their own selfish ends are ready to crush them. This feeling leads to class hostility. A great free government like ours cannot endure if the people are to be divided into classes with feelings of class hostility, one class arrayed against another.

I do not believe that in America this feeling is as yet very widespread or very deep-seated. If all our citizens, employers and employees alike, and especially our legislators, act with fairness, with self-restraint and with wisdom in solving, our great social and industrial problems I

believe that that feeling of brotherhood, so essential in a government like ours, can be kept alive. Now I believe that this school and schools like it, which are trying to serve the interests of the workingman and of the employer alike, can do much to further the cause of industrial peace and of true progress.

Now in conclusion I wish to say a word to the young men who are about to graduate. You go out of this school, not merely as textile workers, not merely as business men or as professional men, you go out as American citizens and you must assume the duties of citizenship. The first duty of the American citizen is very simple and very prosaic but it is all important in a government by the people and that is the duty to vote, to vote at every primary, at every election. This should be looked upon as a sacred patriotic duty which the citizen owes to this Commonwealth and to his country.

If the great social and industrial questions to which I have referred are to be settled aright, if they are to be settled in the interest of the people, then we must have in our halls of legislation men who measure up to the highest standard in ability and in character. Above all we must have men who can be trusted. Emerson says that "the people know that they need in their representative much more than talent, namely, the power to make his talent trusted." It is loss of confidence in representatives, in their ability and in their disinterestedness, which is leading to loss of confidence in representative government.

If we are to preserve our constitution, if our representative form of government is to endure, then we must see to it that we have the right kind of men in public office, men in whom the people have confidence. We must have men who are independent in thought and action, men who have the courage to do that which is right rather than that which is popular, men of such character that they cannot be suspected of serving any private interest or any special class, men who place the public good high above mere party advantage and their own personal ambitions.

"God give us men, a time like this demands
"Strong minds, great hearts, true faith and willing hands,
"Men whom the lust of office does not kill,
"Men whom the spoils of office can not buy,
"Men who possess opinions and will,
"Men who have honor, men who will not lie,
"Men who can stand before a demagogue and face his
treacherous flatteries without winking,
"Tall men, sun-crowned, who live above the fog
"In public duty and in private thinking."

Extract from a report to the Trustees of the Lowell Textile School on the

INTERNATIONAL SMOKE ABATEMENT EXHIBITION

London, England, March 23 to April 4, 1912

By

GEORGE H. PERKINS, S. B.

Head of Engineering Department

LOWELL TEXTILE SCHOOL, LOWELL, MASS.

An International Smoke Abatement Exhibition and Conference under the auspices of the London Coal Smoke Abatement Society, was held at the Royal Agricultural Hall, Islington, London, England, March 23 to April 4, 1912.

OBJECT

The object of the Exhibition was to make a comprehensive display of the most approved modern methods and devices for the abatement of coal smoke, applicable either to industrial plants or domestic fires. Exhibits were also made showing the injurious effects of smoke deposits upon health, building materials, works of art and vegetable life, with the view of creating an active and intelligent public sentiment on the importance of this widespread nuisance.

The educational work was also supplemented by a series of Conferences held in connection with the Exhibition. These Conferences were well attended by official delegates from most of the principal cities of England and Scotland as well as from Germany, Holland, Sweden, and other foreign countries.

The Exhibition attracted much favorable attention from the press and general public, and upon the whole was considered a complete success. The great coal strike which was at its height at the time, while interfering with the attendance and delivery of exhibits to some extent, tended to increase public interest in the affair and to divert attention to the larger question of the conservation of the coal supply.

PRESENT STATUS OF THE SMOKE PROBLEM IN ENGLAND

Smoke has been a recognized nuisance in England for nearly a century. As early as the year 1819, Parliament appointed a committee to investigate this question and this committee reported that effective smoke abatement devices existed and should be used.

The public Health Acts of 1875 and 1891 included sections covering smoke abatement and these ordinances are the only present laws on the subject. These statutes have not proved satisfactory as they are not sufficiently definite and do not make provision for their proper enforcement.

Practically all of the effective work done in abating this nuisance has been accomplished during the past fifteen years. The great improvement in atmospheric conditions, as far as London is concerned, has been due principally to the following agencies:

- (a) The electrification of all of the Underground Railways formerly operated by coal burning locomotives.
- (b) The rapid increase in the use of gas appliances for heating and cooking. When authorities agree that more than one-half of London's smoke comes from domestic fires burning soft coal, the following figures are significant:

Year	Number of Gas Appliances in use
1891	46,000
1896	223,000
1901	445,000
1906	989,999
1911	1,494,000

- (c) The work of the London Coal Smoke Abatement Society, a voluntary association which has for its objects the following:—

- (1) To aid in enforcing the existing law through the local Sanitary Authorities, by the employment of inspectors who, after investigation, shall report offenders to the proper officials.
- (2) To promote and encourage all voluntary efforts to abolish smoke from private dwellings and to investigate the best means for effecting this object.
- (3) To obtain particulars and evidence of methods of dealing with smoke nuisances at home and abroad.
- (4) To publish information on matters relating to smoke nuisances, stimulate invention through the offer of prizes and to conduct tests on heating, cooking and stoking apparatus.
- (5) To effect the amendment of the present laws with the object of making them more efficient.

Other Societies of the same character have been organized in some of the larger cities and are doing effective work along similar lines to that of the London Society. One of the most active of these Societies is the Smoke Abatement League of Great Britain which has its headquarters in Manchester and branches in many of the other large industrial centers.

The most direct evidence of the improvement made in smoke abatement in recent years is in the record of observations of atmospheric conditions taken in many of the large cities. The "black fogs" once so prevalent in London and which have been proven to have been due largely to smoke are today practically unknown. The winter sunshine of London is today about 40 per cent. of that observed in the country districts, which is a figure double that of thirty years ago.

In nearly all of the larger cities a marked improvement along similar lines has been made each year and through the agencies already mentioned. In the manufacturing districts particularly, the boiler users are taking increasing interest in this matter, realizing that it has an important influence upon the efficiency of their plants. The public is also aroused to the situation and the urgency and practicability of smoke abatement seem to be generally appreciated.

SUMMARY OF PAPERS PRESENTED AT THE CONFERENCE

The papers presented at the Conference may be grouped under the following heads:—

A. SMOKE POLLUTION

1. Economic and artistic aspects
2. Effects on plant life

B. SMOKE ABATEMENT

1. Organization of preventive action .
2. Physical principles of smoke abatement

C. LAWS AND LEGISLATION

1. Proposed new legislation
2. Administration of existing law

A. (1) Economic and artistic aspects

Under this head papers were read treating of the effects of smoke upon building materials, mural and house painting, ornamental and structural metal work and also the measurement of soot deposits.

Many examples were cited of the disintegration of the stone in various important and valuable buildings due to the presence of sulphuric acid in the atmosphere. This acid is formed from the union of the oxidized sulphur compounds, resulting from the combustion of coal, with the moisture of the atmosphere. An analysis of stone taken from St. Paul's Cathedral showed 74 per cent. of calcium sulphate, the original stone being calcium carbonate or limestone. Similar results were obtained on samples taken from Westminster and other well known and historic structures. Limestone appears to suffer more than any other variety of stone while granite is not seriously affected.

The effect of smoke on mural and fresco paintings was due to a similar action, the plaster beneath the pigments losing much of its binding power by the chemical change taking place. The effect upon house paint is also very pronounced, particularly on the lead paints. Practically all outside work must be repainted at least once a year. Zinc oxide paints were shown to be far more stable than lead pigments against the action of atmospheric acids.

The most serious effect upon metal work is the corrosion of structural steel. Several collapses of iron roof trusses, notably that of the Charing Cross Station, have resulted from this cause. In some instances it was found that about 10 per cent. of the iron had been dissolved into ferrous sulphate. The corrosion of uncovered iron or steel wire has also been observed and found to be extensive.

During the past year the soot-fall of London has been carefully measured by means of specially devised soot gages. This work has been in charge of the officers of the Smoke Abatement Society and the extraordinary results obtained may be summarized as follows:

The total yearly deposit from the atmosphere was 650 tons per sq. mile or a total of 76,050 tons per annum for the entire administrative County of London of 117 sq. miles. This figure includes 8000 tons of sulphates, 6000 tons of ammonia and 3000 tons of chlorides, the balance being carbon and tarry products. The deposits per sq. mile at Surrey, on the border of the Metropolitan area, was only 195 tons per year or less than one-third that of London proper showing clearly the comparative purity of country air.

A. (2) Effects on plant life

Evidence was given by the authorities in charge of the Kew Gardens and other parks as to the difficulty of maintaining vegetation in smoke effected districts. Only a few hardy plants and shrubs will survive the winter season in the large cities.

The main effects of smoke on vegetation are due to the following:—

1. Reduction of light and heat from the sun.
2. Soot deposits excluding still more light.
3. Tarry deposits blocking the pores of the plants.
4. Acid deposits lowering the vitality of plants.

The effect of a smoke polluted atmosphere upon health was clearly shown by figures given from Glasgow, where a study has been made of the effect of smoke fogs upon the death rate from bronchial diseases such as bronchitis, pneumonia and pleurisy. The deaths from these diseases alone increased at a remarkably rapid rate during prevalent fogs and could be traced to no other source.

B. (1) Organization of Smoke Abatement Work

The work of the various smoke abatement societies was described in detail and many suggestions were made regarding the possible future study of this problem. The majority of these suggestions were along the line of determining the actual economic loss to the community caused by smoke, it being generally conceded that the engineering side of the question is well in hand and sufficiently well developed to meet practically all conditions provided careful study is made of the factors involved.

Some of the elements in the economic loss to a city are as follows:—

1. Added cost of artificial illumination.
2. Added cost of painting exteriors and interiors.
3. Added cost of laundering and other cleansing.
4. Damage to goods in stores and factories.
5. Effect of gloom upon the efficiency of workers.

Recognition was made of the splendid work done on smoke abatement in Cleveland, Ohio, and Chicago, Ill., where the progress made within the past five years has been remarkable. In both of these cities the problem is handled by efficient departments of the municipal governments furnishing a most excellent example of honest, effective and thorough public service.

These two cities are without question well in advance of any other American municipalities in the matter of smoke abatement.

B. (a) The physical principles of smoke abatement

The papers presented under this head covered various phases of the subject including the effect of smoke upon steel making, losses due to incomplete combustion, hand and mechanical firing, the manufacture of smokeless fuels and the construction and operation of producer gas plants.

The production of steel without objectionable smoke, a combination formerly thought to be impossible, was shown to be entirely practicable without affecting the quality of the steel.

Results of tests were also given showing the following:

1. Actual loss due to unburned combustible matter in smoke.
2. Losses due to effect of a non-conducting layer of soot upon the surfaces of boiler tubes and plates.

The value of trained firemen was especially emphasized and figures were given showing that the untrained stoker will burn from 15 to 20 per cent. more coal than a skillful man in producing the same evaporation. The gain in efficiency obtained by firing small charges of fuel at short intervals, over that obtained with large charges at longer intervals, was also shown to be about 5 per cent. Hand firing was recommended as advisable for the majority of plants under 1000 H. P. In these smaller plants even better results may be expected with hand firing than with mechanical stokers, provided careful supervision be given. It was also proposed to add to the present license for firemen, a certificate of competency based upon a knowledge of proper conditions for perfect combustion, heating value of fuels, etc.

Instrumental assistance for the fireman such as recording draft, temperature and gas analysis devices has not been given as much attention as this important class of apparatus has received in America.

C. Laws and Legislation

The larger part of the matter presented under this head would not be applicable in this country for obvious reasons. A strong plea was made, however, for uniform and definite legislation on smoke abatement which is most desirable in any country suffering from this nuisance.

CLASSIFICATION OF EXHIBITS

The exhibits may be classified into the following groups:—

- I. SECTION A. Boiler furnaces; Special grate bars and furnace construction; Mechanical stokers of all types; Smoke preventing devices of various kinds; Fuel economizers; Briquette making machines.
SECTION B. Suction gas plants; Gas and oil engines.
- II. SECTION A. Open coal-fire grates; Stoves and ranges of all kinds; Draft regulators and other smoke preventing appliances for domestic fires.
SECTION B. Gas stoves and grates; Gas heating and cooking appliances.
SECTION C. Electric heating and cooking appliances.
- III. Testing devices including anemometers, tintometers, soot gages, automatic gas analyzing devices, etc.
- IV. Fans and other appliances for the removal of dust of various kinds from industrial plants.
- V. Smokeless fuels, both natural and artificial.

CONCLUSIONS ON SMOKE ABATEMENT

In judging of the merits of the various types of mechanical firing appliances exhibited, it should be recognized that all of these devices were designed for local conditions and for burning English or Scotch coals. These fuels cost from \$2.50 to \$3.50 per ton at the plant, contain from 30 percent. to 35 per cent. volatile matter and 11,000 to 13,000 B. T. U. per lb. In these respects they correspond to our Illinois or other western coals. This class of fuel is not available in New England for economic reasons. The freight charges on coal in this section amount to about \$3.00 or nearly three-quarters of the average cost of fuel per ton. It is therefore not feasible or economical to burn any but the highest grade of bituminous coal in this part of the country for industrial purposes. This class of fuel should contain about 14,000 B. T. U. per lb. and not over 20 per cent. volatile matter. On the chain grate, for example, which gives excellent results in England, this coal could not be burned satisfactorily. It would be impossible to maintain a proper ignition temperature with such a low per cent. of volatile matter

without an excessive draft which would give large losses to the stack. The chain grate is meeting with success in this country wherever fuel of the lower grades is available.

Of the other devices, perhaps the most important are those automatically controlling the air supply, both over and under the fire. These eliminate the personal factor of the fireman and should be effective on any type of hand-fired furnace.

In conclusion, smoke abatement may be best effected in the present state of the art of fuel burning by thorough consideration of the following conditions. Careful attention to one or all of these factors by competent engineers will increase the efficiency of any plant and with efficient combustion comes smokeless operation.

1. Selection of a suitable fuel with provision for maintaining same at fixed standard of heat value.
2. Careful scientific study of the conditions prevailing in the plant including draft, composition of gases, temperatures, etc.
3. Design or selection of type of furnace or apparatus best adapted to meet these conditions.
4. Proper construction or installation of same.
5. Careful selection of operating force.
6. Suitable instrumental aids or guides for the fireman and responsible engineer.
7. Frequent and thorough inspection to insure maintenance of highest possible efficiency.

WORK OF THE HAMBURG SMOKE ABATEMENT SOCIETY

Among the delegates present at the London conference was Herr Nies, Chief Engineer of the Vereins fur Feuerungsbetrieb und Rauchbekämpfung, of Hamburg, who later extended to me in Hamburg many courtesies which brought me into contact with the work of the society.

The Hamburg Society, which was organized in 1902, is essentially different from other organizations of this character in the following important features:—

- (a) It is an entirely voluntary organization of manufacturers and other boilers users bound together only by a common desire to obtain greater efficiency and less smoke from their power plants.
- (b) The working staff of the Society is composed wholly of technically trained engineers.

- (c) All boilers owned by members are under the systematic and scientific control of the expert staff of the Society.
- (d) All members benefit mutually by the published results of all tests and investigations made by the engineers.
- (e) The economy of smokeless combustion is the cardinal principle and the members have been convinced of this in a most practical manner, in the savings effected in fuel consumption by their co-operative effort.

The Society now numbers 436 members, representing 1381 boilers. The annual dues of members are small being only \$5.00 and \$5.00 additional for each boiler in their plants. The Society is entirely self-supporting and draws its funds from three sources:

- (1) Annual dues.
- (2) Payment for special work or reports.
- (3) Payments for outside work.

The education and control of firemen in the proper performance of their duties are also undertaken by the fireman instructors on the staff of the Society.

Comparative tests of fuels, smoke preventive devices, etc., are also carried out by engineers and the results are circulated among the members. Advice is also given on purchase of fuel, the buyers being educated by the engineering staff to appreciate the importance of this matter.

The engineering staff of the Society consists of a Chief Engineer, four assistant engineers and eight trained firemen who act as fireman-instructors. For the chemical and thermal analysis of fuels, the Society avails itself of the testing laboratory of Dr. Aufhauser at Hamburg. This laboratory which is one of the most complete of its kind in Germany, tests about 2000 samples of fuel annually. Dr. Aufhauser also edits a periodical called "Smoke and Dust" to which the engineers of the Society are frequent contributors.

The work of the Hamburg Society is without question as practical and effective scientific work as is done anywhere along these lines. The efficiency of the plants, under its control, is materially bettered and maintained, the owners derive a substantial economic gain and the smoke problem is solved without the aid of the usual unsatisfactory legislation.

There is no reason why the manufacturers of Lowell and vicinity should not co-operate in a similar way and benefit mutually from an organization of this character.

Mr. Perkins also had occasion to visit other Power Stations, Manufacturing Plants, and Textile Schools. Among the most important are the following:—

Lot's Road Station of the London Underground Railways
at Chelsea, London, England.

Salford Electricity Works, Salford, England.

Stuart Street Power Station, Manchester, England.

Shops of the Societe Alsacienne de Constructions Mecanique
at Mulhouse, Alsace.

Shops of Platt Bros. and Asa Lees at Oldham, England.

Roy Spinning Mill at Oldham, England.

J. Hetherington & Sons, Manchester, England.

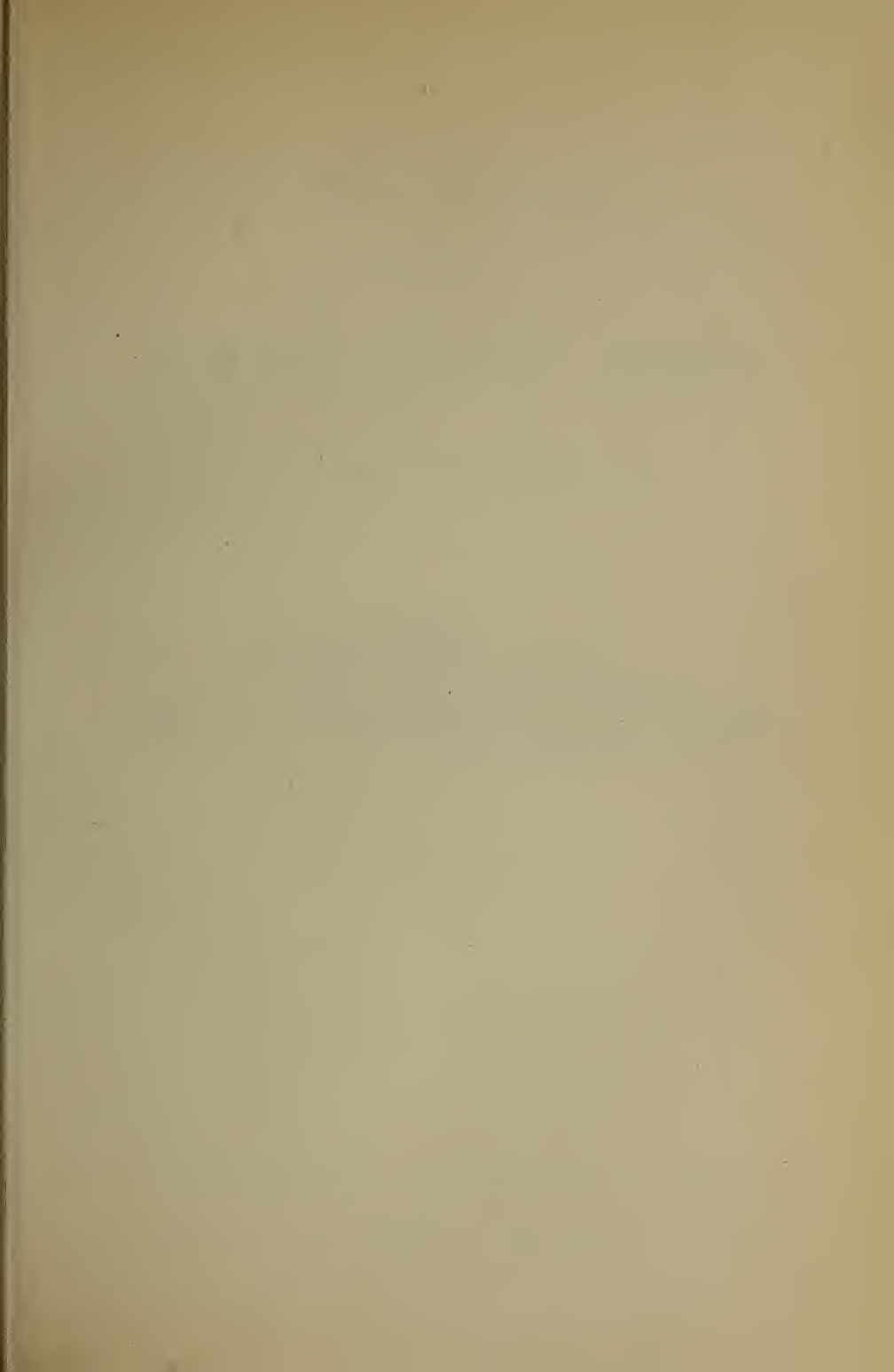
Municipal Technical School, Manchester, England.

Higher Textile School at Aachen (Aix la Chapelle),
Germany.

SCHOOL CALENDAR

Fall entrance examination September 10 and 11, 9 A. M.

Fall term commences September 24, 1912.





BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

FOR BULLETIN AND TERMS ADDRESS CHARLES H. EAMES, PRINCIPAL

In Time of Peace Prepare for War

This familiar adage finds many applications in the political and industrial worlds. A very forcible example of a literal application was the success of our naval arms in the Spanish American conflict of 1898. The skill and marksmanship of our gunners was the result of many years practice, the expenditure of a large amount of money, of time, personal thought and energy in time of peace to raise the naval efficiency to the highest value. The tests showed the wisdom of this procedure.

During the last three or four years there has been evidence of industrial depression which has shown itself more in some branches than in others. Previous to this period, however, business prosperity was marked, and many manufacturing concerns found that they did not have plants of sufficient size to produce their furnished material in quantities to meet the demands of the market. When a little later this pressure was removed, these same concerns turned their attention to increasing their plants and preparing for the next period of greater demands. With the recent improvement in business conditions the wisdom of this forethought and preparation is realized.

What is true in the business of countries and industries is also true in the business of education, or the preparation which every youth should consider necessary to fit him for the place he is to occupy in the world, and the work he is to do in his chosen field. If it is wisdom for the manufacturer in the time of "industrial peace" (the period of small demand) to prepare for the "industrial war" (the period of great demand) it is also wisdom for the youth of the preparatory school to spend time and energy in study and work that he may meet the demands to be made on him. It is recognized that the periods of business intensity follow one another in waves or cycles, and the belief in this law gives assurance in times of depression that the crest of the wave must surely follow. If we are to see for the next few years, as some people believe, a depression in the wave of prosperity, we can be assured that this will be followed by the crest,

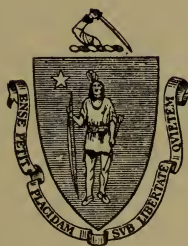
which will mean a demand for those who have prepared themselves by training and education during the depression.

One of the industries to be most sensitive to these periods of business intensity is the textile. While there is a demand on the part of this industry for trained and educated young men at all times, there has been and will be a greater demand for them when the industry is advancing on the crest of the waves. It is therefore wise for a young man to prepare now for the period of greater development. When the depression again returns the wisdom of having this type of employees is even more appreciated and the need of their services is always apparent. That this belief is a correct one is shown quite forcibly by the report cards received yearly by the Lowell Textile School from its graduates. The cards this year contain the information as to the position held at the present time and the position acquired immediately after graduation. Some of these interesting facts are herewith given.

POSITION AFTER GRADUATION	PRESENT POSITION
Percher	Asst. Designer
Instructor in Textile School	Director in Textile School
Laboratory Chemist	Dyestuff Salesman
Asst. Overseer of Dyeing	Asst. Overseer of Dyeing
Wool Sorter	Treasurer of Knitting Co.
Draughtsman	Woolen Designer
Clerk	Mill Accountant
Asst. Supt. of Linen Mills	Asst. Supt. of Linen Mills
Asst. to Treasurer	Treasurer of Woolen Mills
Second Hand in Bleachery	Foreman in Bleachery
Dye House Hand	Overseer
Asst. Chemist	Efficiency Engineer
Second Hand in Weaving	Asst. Supt. of Worsted Mills
Color Chemist	Head Chemist
Chemist	Supt. of Bleachery
Section Hand Worsted Drawing	Supt. of Linen Mills
Operative in Print Works	Overseer of Color Dept.
Designer	Supt. of Woolen Mills
Operative in Picker Room	Treasurer of Cotton Mill
Apprentice in Worsted Mill	Agent of Worsted Mill
Cost Accountant	U. S. Custom Examiner
Paper Colorist	Overseer of Dyeing
Instructor in Textile School	Supt. of Woolen Mills
Clerk	Vice-President of Worsted Mill



ANNUAL REPORT
OF THE
TRUSTEES,
OF THE
LOWELL TEXTILE SCHOOL
OF
LOWELL, MASSACHUSETTS, U. S. A.
FOR
1912



BOSTON
WRIGHT & POTTER PRINTING CO., STATE PRINTERS
18 POST OFFICE SQUARE
1913



ANNUAL REPORT OF THE TRUSTEES OF THE LOWELL TEXTILE SCHOOL FOR 1912.

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled.

The trustees of the Lowell Textile School of Lowell, Mass., respectfully submit the following report for the calendar year 1912, in compliance with chapter 248, Acts of 1904, which provides: —

SECTION 1. The trustees of every textile school receiving financial aid from the commonwealth shall, on or before the thirtieth day of January in each year, make to the general court a report containing a concise statement as to the buildings, equipment and resources of the school, the courses and methods of instruction, the number of teachers and students, if any, who graduated therefrom. The report shall also contain a statement, verified by the oath of the treasurer of the school, and in such form as the auditor of accounts of the commonwealth shall prescribe, showing separately the amounts received during the previous calendar year from tuition fees, from the commonwealth, from any city or town, and from all other sources, and also showing the expenditures of the school during the same period, under the heads of maintenance, construction, and new equipment, and also the financial condition of the school at the close of said year.

TRUSTEES OF THE LOWELL TEXTILE SCHOOL IN ACCOUNT
WITH A. G. POLLARD, TREASURER.

LOWELL, MASS., Dec. 31, 1912.

MAINTENANCE ACCOUNT.

Paid for —

Teachers' salaries,	\$38,389 37	
Administration salaries,	6,228 95	
Employees' salaries,	7,281 05	
General expense,	12,002 78	
Supplies,	4,958 00	
Power and light,	5,179 12	
Special service,	1,210 45	
Chemistry deposits,	933 19	
Insurance,	3,697 09	
Refund of tuition,	33 00	
		<hr/>
		\$79,913 00

Deduct ledger debits as follows: —

Cash received from —

Chemistry deposits,	\$2,510 04
Supplies, books sold,	1,601 57
Special service,	1,289 75
Stock sold,	599 01
Use of telephone,	8 34
Sale of junk,	3 00
Rebate of insurance,	2,995 65

\$9,007 36

Supplies on account of 1913, 2,479 00

11,486 36

Net cost of maintenance for 1912, \$68,426 64

Cash received from —

Commonwealth of Massachusetts,	\$40,000 00
City of Lowell,	8,000 00
Tuitions,	13,783 80

61,783 80

Deficiency Jan. 1, 1913, \$6,642 84

EQUIPMENT ACCOUNTS.

Chemistry and Dyeing Department, Special Equipment Account.

Cash on hand Jan. 1, 1912,	\$110 33	
Amount received from Commonwealth of Massachusetts,	2,500 00	
Amount expended during 1912,		\$197 06
Balance on hand Jan. 1, 1913,	2,413 27	

New Equipment Account.

Cash on hand Jan. 1, 1912,	\$2,707 82	
Amount expended during 1912,		2,675 49
Balance on hand Jan. 1, 1913,	32 33	

Finishing of Cotton Fabrics Equipment Account.

Amount received from Commonwealth of Massachusetts,	\$10,475 00	
Amount expended during 1912,		\$724 81
Balance on hand Jan. 1, 1913,	9,750 19	

Electrical Laboratory Equipment Account.

Amount received from Commonwealth of Massachusetts,	\$3,279 00	
Amount expended during 1912,		569 02
Balance on hand Jan. 1, 1913,	2,709 98	

Textile Testing Equipment Account.

Amount received from Commonwealth of Massachusetts,	\$2,084 00	
Amount expended during 1912,		28 05
Balance on hand Jan. 1, 1913,	2,055 95	
Total paid for equipment,		<u>\$4,194 43</u>

CONSTRUCTION ACCOUNTS.

Boiler House.

Cash on hand Jan. 1, 1912,	\$10,206 27	
Amount received from American Mutual Liability Insurance Company,	24 00	
Amount expended during 1912,		\$10,084 24
Balance on hand Jan. 1, 1913,	146 03	
Total paid for construction,		<u>\$10,084 24</u>

SUMMARY OF RECEIPTS AND EXPENDITURES.

	Received.	Paid.
Cash on hand Jan. 1, 1912,	\$13,027 82	—
Maintenance,	61,783 80	\$68,426 64
Equipment,	18,338 00	4,194 43
Construction,	24 00	10,084 24
	<u>\$93,173 62</u>	<u>\$82,705 31</u>
Loans,	35,000 00	35,000 00
Cash on hand Jan. 1, 1913,	—	7,989 31
Supplies on hand Jan. 1, 1913,	—	2,479 00
	<u>\$128,173 62</u>	<u>\$128,173 62</u>

FINANCIAL CONDITION DEC. 31, 1912.

	<i>Trial Balance.</i>	Dr.	Cr.
Lowell Textile School,		—	\$629,466 57
Land,		\$105,639 09	—
Machinery and equipment,		240,692 31	—
Supplies,		16,964 64	—

Notes payable,	-	\$50,000 00
Southwick Hall,	\$142,120 30	
Kitson Hall,	31,390 91	-
Weave building,	22,150 07	-
Boiler house,	45,472 80	-
Weave wing extension, head house,	30,061 73	-
Falmouth Street building,	15,000 00	-
Colonial Avenue building,	21,985 41	-
Cash,	7,989 31	-
	<hr/>	<hr/>
	\$679,466 57	\$679,466 57

Notes Payable.

Note dated Oct. 9, 1909, on demand,	\$17,500 00
Note dated Dec. 30, 1911, on demand,	10,000 00
Note dated March 30, 1912, on demand,	5,000 00
Note dated April 11, 1912 (balance), on demand,	7,500 00
Note dated June 1, 1912, on demand,	5,000 00
Note dated June 29, 1912, on demand,	5,000 00
	<hr/>
	\$50,000 00

SPECIAL TRUST FUND ACCOUNT DEC. 31, 1912.

Special Book Prize Fund.

Amount contributed by Prof. L. A. Olney for prizes of books to honor students in chemistry and dyeing:—

Balance on hand Jan. 1, 1912,	\$85 78
Balance on hand Jan. 1, 1913,	\$85 78

The above special fund is not included in the general account.

To the Trustees of the Lowell Textile School.

This is to certify that I have examined the books of the treasurer of the Lowell Textile School for the year ending Dec. 31, 1912, and find them to be correctly kept and properly vouched.

A. A. LUDWIG,
Auditor for the Corporation.

LOWELL, MASS., Jan. 29, 1913.

LOWELL, MASS., Jan. 30, 1913.

I certify that the foregoing is a correct statement of the receipts and expenditures on account of the Lowell Textile School during the calendar year 1912, and of the financial condition of the corporation at the close of said year.

A. G. POLLARD, *Treasurer,*
Trustees of the Lowell Textile School.

LOWELL, MASS., Jan. 30, 1913.

MIDDLESEX, SS.

Subscribed and sworn to before me this day.

JOHN F. SAWYER,
Justice of the Peace.

Approved as to form.

WM. D. HAWLEY, *Deputy Auditor of the Commonwealth.*

STATEMENT AS TO BUILDINGS, EQUIPMENT, RESOURCES, ETC.

LAND.

Land bounded by Standish, Riverside and Moulton streets, and Merrimack River and Colonial Avenue, about 14 acres, . . .	\$105,639 09
--	--------------

SCHOOL BUILDINGS.

Southwick Hall: 80 by 265 feet; three stories, with two-story wings and finished basement under all; cost,	\$142,120 30
Kitson Hall: 63 by 184 feet; one story, with basement; cost,	31,390 91
Boiler house: 63 by 68 feet; one story; cost,	14,875 16
Falmouth Street buildings: 80 by 192 feet; three stories, with basement; cost,	67,211 80
Colonial Avenue laboratories; cost,	21,985 41
Total cost of buildings,	\$277,583 58

New boiler house in process of construction not included above.

The floor space is divided between the departments and offices as follows:—

	Square feet.
Cotton yarns,	12,000
Woolen and worsted yarns,	28,160
Decorative art,	1,446
Textile design,	15,360
Chemistry and dyeing,	28,400
Power weaving,	15,360
Finishing,	5,806
Mechanical and electrical engineering,	15,729
Power plant,	5,000
Administration,	2,930
Assembly and physical culture halls,	10,800
Entrances, corridors, stairways, toilets, store and locker rooms,	14,487
Total floor space in all buildings,	155,478
Cost per square foot of floor space,	\$1 79

EQUIPMENT.

Cotton yarn department,	\$33,725 15
Woolen and worsted yarn department,	45,509 69
Textile design and power-weaving department,	32,368 09
Chemistry and dyeing department,	24,553 37
Textile engineering department,	33,107 05
Finishing department,	13,803 78
Corridors,	237 50
Trustees' room,	881 40
Lecture hall,	485 36
General office,	941 10
Principal's office,	746 05
Janitor's rooms,	413 88
Lunch room,	220 63
Storeroom,	206 75
Library,	2,791 13
Locker room,	556 00

Students' room,	\$168 00
Physical culture apparatus,	558 29
Southwick Hall, heating, sprinkling and electrical system,	11,495 79
Kitson Hall, heating, sprinkling and electrical system,	1,326 90
Falmouth Street building, sprinkling and electrical system,	4,466 80
Power plant,	15,555 15
Miscellaneous equipment pertaining to all buildings,	16,574 45

Total,	<u>\$240,692 31</u>
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The increase in value of equipment is: —

Purchased,	\$4,194 43
Contributed or made at the school,	902 35

Total,	<u>\$5,096 78</u>
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COURSES OF INSTRUCTION.

CLASSIFICATION OF DAY STUDENTS BY COURSES.

	First Year.	Second Year.	Third Year.	Fourth Year.	Post- graduate.
Cotton manufacturing,	6	6	3	—	—
Wool manufacturing,	5	5	3	—	—
Textile design,	6	2	2	—	—
Chemistry and dyeing,	13	12	10	2	6
Textile engineering,	21	10	7	1	8
Course not chosen,	2	—	—	—	—
	53	35	25	3	14
Total,	130				

CLASSIFICATION OF EVENING STUDENTS BY COURSES.

	First Year.	Second Year.	Third Year.	Post- graduate.
Cotton spinning,	37	14	—	—
Knitting,	7	—	—	—
Woolen and worsted spinning,	51	6	6	—
Textile designing,	68	20	7	—
Freehand drawing,	29	7	2	2
Elementary chemistry,	50	13	—	—
Textile chemistry and dyeing,	2	4	4	—
Analytical chemistry,	5	—	1	—
Special chemistry,	2	—	—	—
Weaving (cotton),	9	—	—	—
Weaving (woolen and worsted),	33	—	—	—
Weaving (dobby and Jacquard),	15	—	—	—
Mechanics,	134	—	—	—
Steam engineering,	—	21	—	—
Electricity,	—	—	32	—
Mechanical drawing,	50	19	4	—
Machine shop,	28	16	—	2
Mathematics,	50	—	—	—
Finishing,	16	—	—	—
	586	120	56	4
Total,				766
Names counted twice,				58
Net total,				708

NUMBER OF STUDENTS.

Jan. 1, 1912:—

Day classes,	.	.	.	.	.	.	.	.	.	167
Evening classes,	.	.	.	.	.	.	.	.	.	621
Total,	.	.	.	.	.	.	.	.	.	788

Graduated:—

Day classes,	.	.	.	.	.	.	.	.	.	24
Evening classes,	.	.	.	.	.	.	.	.	.	74
Total,	.	.	.	.	.	.	.	.	.	98

Jan. 1, 1913:—

Day classes,	.	.	.	.	.	.	.	.	.	130
Evening classes,	.	.	.	.	.	.	.	.	.	708
Total,	.	.	.	.	.	.	.	.	.	838

TEACHERS.

NUMBER BY DEPARTMENTS.

Cotton yarn,	.	.	.	.	.	.	.	.	.	3
Woolen and worsted yarn,	.	.	.	.	.	.	.	.	.	4
Textile design and weaving,	.	.	.	.	.	.	.	.	.	6
Chemistry and dyeing,	.	.	.	.	.	.	.	.	.	8
Textile engineering,	.	.	.	.	.	.	.	.	.	5
Finishing,	.	.	.	.	.	.	.	.	.	1
Language and history,	.	.	.	.	.	.	.	.	.	1
Physical culture,	.	.	.	.	.	.	.	.	.	1
Total,	.	.	.	.	.	.	.	.	.	29
Average number of students per teacher,	.	.	.	.	.	.	.	.	.	28

ROSTER OF SCHOOL OFFICERS AND INSTRUCTION CORPS.

PRINCIPAL.

Charles H. Eames, S.B., Massachusetts Institute of Technology, 1897. Experience: secretary of the Lowell Textile School and instructor in electrical engineering and mathematics; superintendent, Light, Heat and Power Company, Lowell, and engineer with Stone & Webster, electrical engineers, Boston, Mass.

INSTRUCTORS.

Textile Engineering.

George H. Perkins, S.B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience: draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood, Greene & Co., Boston, Mass.

Herbert J. Ball, S.B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906. Experience: draftsman, Watertown Arsenal, Watertown, Mass.; Lincoln & Williams Twist Drill Company, Taunton, Mass.

Ulysses J. Lupien, S.B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.

David M. Hunting, A.B., Harvard College, 1904; Massachusetts Institute of Technology, S.B., 1912.

Charles H. Jack, instructor in machine-shop practice. Lowell Textile School. Experience: Amoskeag Manufacturing Company, Manchester, N. H.

Chemistry and Dyeing.

Louis A. Olney, A.C., M.S., chief instructor. Lehigh University, 1896. Experience: instructor, Brown University; dyeing and finishing department, Stirling Mills, Lowell, Mass.

Miles R. Moffatt, S.B., instructor in chemistry. Columbia University, 1901. Experience: assistant instructor in physics, Columbia University; chemist, Mallinckrodt Chemical Works, St. Louis, Mo.; chemist, Atlantic Mills, Providence, R. I.

Robert R. Sleeper, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday & Sons, Limited, New York City; H. A. Metz & Co., New York City; Hamilton Print Works, Lowell, Mass.; Merrimack Manufacturing Company, Lowell, Mass.

Howard D. Smith, Ph.D., instructor in chemistry. Tufts College, 1906; Brown University, 1904; Rhode Island College, 1901. Experience: assistant instructor, Brown University and Tufts College; instructor, Beloit College, Wisconsin.

Russell B. Stoddard, A.B., Clark College, 1912.

Lloyd Van Doren, Ph.D., Pennsylvania College, 1909; Johns Hopkins University, 1912.

Harold W. Leitch, instructor in chemistry. Lowell Textile School, 1912.

Warren H. Whitehill, assistant instructor in dyeing. Lowell Textile School, 1912.

Textile Design and Weaving.

Hermann H. Bachmann, chief instructor. Gera Textile School, Germany. Experience: Gustav Weise Public Designing House for the City of Gera; Parkhill Manufacturing Company, Fitchburg, Mass.; Lorraine Manufacturing Company, and Smith Webbing Company, Pawtucket, R. I.

Stewart Mackay, instructor in textile design and cloth analysis. Lowell Textile School, 1906. Experience: Bay State Mills, Lowell, Mass.; George C. Moore Wool Scouring Mills, North Chelmsford, Mass.

Starr H. Fiske, assistant instructor in design and weaving department. Lowell Textile School, 1909. Experience: Amoskeag Manufacturing Company, Manchester, N. H.

Joseph Wilmot, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.; Draper Company, Hopedale, Mass.; Crompton & Knowles Loom Works, Worcester, Mass.

Albert E. Musard, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder & Ellis, Philadelphia, Pa.; Nye & Wait Carpet Company, Auburn, N. Y.

Elizabeth Whitney, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching.

Cotton Yarns.

- Stephen E. Smith, chief instructor. Lowell Textile School, 1900. Experience: draftsman, Lowell Machine Shop, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.
- Herbert C. Wood, instructor in cotton yarns. Lowell Textile School, 1906. Experience: Tremont & Suffolk Mills, Lowell; Whitin Machine Works, Whitinsville, Mass.
- Henry K. Dick, instructor in knitting. Experience: Linnville Hosiery Factory, Lanark, Scotland.

Woolen and Worsted Yarns.

- Edgar H. Barker, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, Mass.; wool scouring.
- John N. Howker, instructor in wool sorting and scouring. Technical School of Saltaire near Bradford, Eng.; certificate from City and Guilds of London. Experience: Saltaire Mills, Yorkshire, Eng.; Goodall Worsted Company, Sanford, Me.; Arlington Mills, Lawrence, Mass.
- Eugene C. Woodcock, instructor in French spinning and woolen and worsted yarns. Lowell Textile School, 1907. Experience: Wood Worsted Mills, Lawrence, Mass.
- John C. Lowe, instructor in woolen yarns. Lowell Textile School, 1911. Experience: Wood Worsted Mills, Lawrence, Mass.

Finishing.

- Arthur A. Stewart, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woolen Manufacturing Company, Montreal, Can.; American Woolen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor in woolen and worsted yarns, Lowell Textile School.

CULTURAL COURSES.

Languages and History.

- Lester H. Cushing, A.B., Harvard College, 1911. Experience: Lowell Textile School, Lowell.

Physical Culture.

- Ralph E. Guillow, physical director. International Y. M. C. A. Training School, Springfield, Mass., 1910. Ten years' experience in physical culture in various schools and institutions.
- Archibald R. Gardner, M.D., medical adviser. Harvard University, 1902.

The following are the changes which have taken place in the corps of instructors during the past year: —

In the textile engineering department David M. Hunting, B.S., has been engaged as instructor in mechanical drawing in place of E. J. Batty, resigned.

In the chemistry and dyeing department Russell B. Stoddard, A.B., takes the place of Robert Kirkpatrick, resigned. Lloyd Van Doren, Ph.D., fills the position made vacant by Reginald S. Bochner, B.Sc. Harold W. Leitch, 1912, takes the place of Walter E. Hadley, resigned. Warren H. Whitehill, 1912, takes the place of John C. Standish, resigned.

POSITIONS HELD BY DAY GRADUATES.

Director of textile school,	4
Instructor textile or industrial school,	11
Mill corporation treasurer,	6
Mill agent,	4
Mill superintendent,	25
Mill assistant superintendent,	7
Mill assistant manager,	3
Mill foreman of department,	16
Assistant to superintendent,	1
Mill auditor and accountant,	9
Textile examiner,	3
Textile designer,	16
In commission house,	9
Draftsman,	4
Chemist and dyer,	55
In business, textile distributing or incidental thereto,	5
Other business,	33
Trade journalist,	3
Student,	3
Machinist,	2
Physical director,	1
Efficiency engineer,	1
Industrial engineer,	4
Sanitary engineer,	1
Construction engineer,	2
Second hand,	1
Wool houses,	1
Chemical salesman,	6
Minor mill positions,	13
Employment not known,	19
Deceased,	4
Total,	272

METHODS OF INSTRUCTION.

Instruction is first given in the principles of the sciences applicable to the textile and textile machinery industries, followed by instruction in the practical art, — the application of such sciences to the processes and machinery of manufacture.

Day instruction offers five courses of three or four years, as the student may elect, namely, cotton manufacturing, wool manufacturing, textile design, — including weaving and finishing, — chemistry and dyeing and textile engineering.

Freshmen in the day classes during the first half year receive the same general instruction. At the beginning of the second half they are expected to choose one of the regular day courses. Each course, however, in addition to the specialty indicated by its name, includes some features of every other course, as

such instruction, it is found, adds to the efficiency of the pupil by added breadth in the line he has chosen.

While there are several regular courses offered they may be generally grouped in three grand divisions, namely, textile engineering, chemistry and dyeing and textile design.

Textile engineering includes the mechanism of all machinery used in all departments of the school, and also machine-shop practice; instruction in the generation, transmission and application of power, whether steam, hydraulic, electrical or gas. In boiler and engine testing, for which a very complete and modern laboratory is provided, the pupils are called upon to make, or are afforded opportunities for conducting, continuous twenty-four hour tests, boiler and plant tests, etc. This division also includes mill construction of all modern types, viz., steel and concrete masonry and wood, and combination of both, involving the laying out of plants, shafting, etc.; the use of the transit in surveying; physics as involved in the testing of fibers, yarns and fabrics; mechanical drawing; and the plans for and the construction of equipment. The pupil is first thoroughly grounded in the principles of mechanical, electrical and hydraulic engineering before attempting the more advanced and specialized problems. The higher mathematics form an important part of the work of this department. Here the plans for the school buildings are prepared, and all construction conducted during the summer vacation is by the engineers and pupils who remain for practical experience in this line of work.

Chemistry and dyeing involves a thorough course in chemistry, followed by an applied course, first in the laboratories, and finally on commercial vats, presses, kiers, dryers, etc., in raw stock, yarns and fabrics. A special and growing branch is the making of dyes from raw minerals, vegetables, oils, etc. A special laboratory is equipped for testing coal and oil.

Textile design includes, first, instruction in color, conventionalizing of nature forms, historic ornament, etc., fundamental to all branches of decorative art, and then in the application thereof to textiles. Included under this head is all fabric weaving and finishing.

Incidental to these general divisions is instruction in English, German, French and physical culture.

For evening instruction the day courses are subdivided into sixteen courses. These courses are arranged to cover substantially the same subject-matter as the day courses, but planned to meet the demand of those who wish instruction in special branches and who do not necessarily wish to pursue as complete a course as do those who attend the day classes. If an evening student wishes to cover the same subjects as are offered in the day classes he may do so, and can attain rank in a diploma course by taking the necessary examination.

Unlike most schools the same instructors serve day and evening, thus insuring to the evening pupils from the mills and shops the same able and thorough instruction as the day pupils, for it does not necessarily follow that the humbler youth should have a poorer school.

It has for some years been growing more and more evident that our instructors and pupils were being overworked, and had not sufficient time given in a three-year course to deal with some advanced specialties. A postgraduate course was established to relieve the situation for which will be substituted a regular four-year course with the offer of degrees, as recommended by the State Board of Education, in textile engineering (B.T.E.) and textile dyeing (B.T.D.), the school thus passing from the technical to the technological class as originally intended. It will include more time given to present features of the curriculum and advanced work, to which is added scientific mill management, cost-finding, mill accounting, general corporation organization, commercial law and usage, patent laws and practice, principles of banking, etc., useful and essential to our graduates as they advance to positions of responsibility in the textile industry. See House Document No. 3, session of 1912.

Most of our day pupils matriculate directly from the high schools or academies. So thorough is our instruction that they graduate directly into employment in the industry or kindred lines, and, as they rapidly advance to the higher responsibilities, they need instruction that the school has lacked time to impart. Hence, in addition to the technique of the industry is now included instruction incidental but essential to the positions they occupy or aspire to. At some technical schools and colleges it is sought to meet this need by recommending prescribed courses in reading after graduation, but this, being optional

with the graduate, may or may not be given attention. By limiting these subjects to essentials and making them obligatory it is thought the pupils will more certainly be benefited.

The scientific method in mill management — with special reference to “efficiency or production engineering” as presented by Taylor, Gantt, Gilbreth, Emerson, Gunn, Richards, Cooke, Patterson and others, mostly of the eminent Society of Mechanical Engineers — and cost finding is to be a leading feature of the fourth year to be added to the three-year course now at the school.

The published works of these engineers, or papers specially prepared by them for this school, have been furnished the fourth-year pupils, and when they are grounded in the principles of this scientific method of management they are instructed in the method of applying them to textile processes, and are then required to pass an examination therein.

Mindful that pragmatism, as expounded by the late Professor James of Harvard, may from the standpoint of economics be summed up in this, that a theory is valuable only as it is found useful in application, or, more homely expressed, “the proof of the pudding is in the eating,” efficiency literature is sent out to our graduates, already filling a great variety of positions, with the request that they use their eyes and brains and give us the benefit of their criticism and the problems they meet with from their various standpoints of supervision in practical manufacture.

Nearly all of our graduates go to positions that make it most important that they be fully instructed as to the latest improved methods of dealing with labor, and thoroughly trained as they are at the school in the make-up, installation and operation of machinery they should be exceptionally capable of testing the various efficiency systems proposed. Papers already received from those out in employment and from their employers indicate that “efficiency or production engineering” has a useful place in the textile industry and will, when fully applied to all departments of a mill, result in as great benefits to employees and employers alike as has resulted in its application at the shops. Provision will be made for efficiency instruction at the school the coming year in this line of work.

CORPORATION SUPERVISION.

An annual meeting is held in January for the election of officers, reception of annual reports and the transaction of such other business as may be proposed, not committed to the Board of Directors. Monthly meetings at the school of the trustees, sitting as a Board of Directors, are provided for. They appoint such agents, school officers and teachers as they find necessary, prescribe their duties and fix their compensation. The president (in his absence the vice-president) presides at all the meetings of the corporation and Board of Directors, and performs such other duties and exercises such other authority as the corporation or Board of Directors may from time to time devolve on him. The treasurer is charged with the general care of the pecuniary affairs and concerns of the corporation, he to receive all revenues and make all authorized disbursements. He is required to report receipts and expenditures and financial conditions quarterly to the Board of Directors, and annually to the corporation. He is also to execute all contracts made by express authority of the corporation or Board of Directors and approved by the president. He, with the president and two elected trustees, composes a finance committee which passes upon all orders for expenditures and inspects all bills before payment. No expenditure is authorized or liability to be incurred in excess of money available to meet it except by vote of the Board of Directors at a meeting, in the call for which due notice of the nature of such proposed expenditure or liability is given. The clerk is required to keep a record of all regular and special meetings of the corporation and Board of Directors, notify all members of such meetings seven days in advance, and perform such other duties as the corporation or Board of Directors may require of him. He is a resident trustee devoting his time to the development work.

A corporation committee, of which the resident trustee is chairman, is charged with the organization and conduct of the nonresident postgraduate course.

In addition to the finance committee there are general committees of ways and means, building and legislative, and lectures. There is also a subcommittee for each department

of the school, composed, as far as is practicable, of trustees identified in manufacturing with the specific branch of industry to which their department relates. They are to make recommendations to the Board of Directors as to the needs, etc., of their respective departments, and especially as to the new equipment, floor space, etc., and to perform such other duties as the directors may require of them.

The principal of the school is charged with its conduct, and is directly accountable to the Board of Directors, making monthly reports thereto and such recommendations and special reports as to efficiency, discipline, etc., as in his judgment are required.

CONCLUSION.

At the last session of the Legislature the fiscal year of textile schools was changed from calendar to school year, beginning July 1, 1913, and ending June 30, 1914, and so thereafter. There was not time to properly close our accounts to December 31, make our financial and other reports to the Legislature, determine our annual needs, and prepare and file our bills by the early dates required by law. By such change we would be able to more exactly and intelligently comply with the requirements of chapter 248, Acts of 1904, as quoted on the first page of this report, see chapter 445, Acts of 1912.

As our annual grants from the State treasury have only provided for deficiencies up to December 31, we have to ask aid for the last half of the school year 1912-13, from January 1 to June 30, 1913, and also for the next school year from July 1, 1913, to June 30, 1914, or for eighteen months instead of twelve as formerly. This was clearly understood last year at committee hearings when the change of the fiscal year was under consideration; in fact, the suggestion that we should so provide came from the committees. Coupled with this legislation was a provision that after temporary loans to carry us through to June 30, 1913, such loans were to be cancelled when, at the session of 1913, new appropriations became available, we to be prohibited thereafter from borrowing money (see chapter 148, Resolves of 1912).

Our bills for aid (not at this date in print), therefore, are for the period of eighteen months.

The school has grown year by year, until last year we were able to open the last division for giving complete instruction in textile manufacturing in all branches as contemplated in the original plan of organization and establishment. There are some gaps in the equipment it is essential to fill, but it is hoped these will be provided for from balances coming over from the grants had last year with the appropriations asked for this year. While we shall thus have what may be styled a standard equipment, in the progress of inventions and improving processes, there will constantly arise necessities for the expenditure annually of some few thousands of dollars for new equipment.

As our requests for State aid have steadily increased in amounts during the period of the development of the plant there has been a general desire to know when a limit would be reached. We have now arrived at a date when such a limit can be safely estimated, and, adopting a suggestion made during the very thorough and exhaustive investigations of the Commission on Efficiency and the State Board of Education, have filed alternative bills, — two in the usual form, one calling for the annual grant for maintenance and the other containing equipment and construction items, while the third bill provides an annual appropriation covering all demands for ten years, the form in which aid is granted to the Massachusetts Institute of Technology and the Worcester Polytechnic Institute. Such an annual provision would make for economy in contracting for materials and instructors that the present method of granting aid does not. If Bill No. 3 is preferred, Nos. 1 and 2 will be unnecessary and *vice versa*.

This year we regret to have to come to the Legislature with two last-year deficiencies. First, \$6,642.84 for maintenance is made up of an overestimate last year of \$4,505, revenues from tuition, and \$1,937.84 increased expenditures for instructors, with the exception of \$228.84 miscellaneous items, as shown in detail in the treasurer's annual report herewith.

Last year we lost, as our roster herewith shows, five efficient instructors for whom educational institutions and manufacturers offered higher salaries than our means would enable us to grant. This loss should be evidence that we are not extravagant in the matter of salaries.

Again a deficiency of \$3,630 is estimated in the new boiler-house appropriation. The plans for this building and connections therewith were made nearly three years ago, the cost being very closely estimated on the basis of information carefully obtained of the cost of labor and material, at that time it being assumed that an appropriation would be available for construction during the building season of 1911. It could then undoubtedly have been built within the estimate, but 1911 and also 1912 were years of thorough investigation of all money bills by experts, delaying action by the Legislature, and while all that was asked for was finally granted the construction was necessarily extended over two years. In the meantime prices of all material were raised from 40 to 150 per cent.; hence the deficit. Had we contracted the work a lower estimate than ours could not have been made, but a contractor would have done what we did not, — that is, added a liberal allowance for unforeseen contingencies and then a liberal sum for profit. Although we have, for reasons which were beyond our control, exceeded the sum originally provided for this job, unquestionably it would have cost from \$8,000 to \$10,000 more for equal quality of work had we contracted for it. We still think it a saving to the State to estimate closely and do our own work, taking chances of a deficiency from causes we cannot control, than to contract with lowest bidders when we have not the certainty of getting equal quality of work for our money. We invite rigid comparison of the work, quality and cost on our buildings and grounds under the two methods. When we do our own work "first cost has always been last cost." We refer to previous reports for examples of economy in construction on which our wide reputation for economy is based.

The textile industry represents approximately \$300,000,000 of capital invested in Massachusetts. If we add to this sum the raw stock chemical and dye business, and that of the great textile distributing houses, etc., we exceed half a billion of capital; and then this industry is the largest purchaser of the products of the other State industries. It is this industry that gives Massachusetts its pre-eminence among manufacturing States, and from which unquestionably the Commonwealth derives its largest revenues. In the light of these considera-

tions the sums granted for the support of industrial education seem insignificant. If in agriculture he is a benefactor who makes two blades of grass to grow where but one grew before, he is at least equally so who doubles, perhaps quadruples, the efficiency of the labor employed in this the other great wealth-producing industry of the Commonwealth. Surely, as declared on the floor of the House, after the expenses of maintaining the State government are provided for, no public money is spent more wisely than that granted to support the Lowell Textile School.

To meet the demands of labor for higher compensation two methods are pursued: one by strikes, occasionally developing into rioting; the other, by individual effort through education that increases the efficiency of the laborers.

Lowell and Lawrence are alike textile manufacturing cities. In both there is equal variety of imported races, the labor colony employed in the mills being substantially the same.

In the former was recently sought increased compensation by the former method at a reported cost to the Commonwealth of \$180,000, to the city of Lawrence of \$80,000, and when you add thereto the losses of labor and to the mill concerns you have a sum probably in excess of what the Lowell Textile School has cost the Commonwealth during the sixteen years of its existence, while Lowell has remained comparatively free from labor controversies.

Several thousands of our mill workers have attended our day and evening classes, each individual seeking thorough training and education to increase his or her labor value. These are naturally the more ambitious and assertive. They increase their compensation through greater efficiency or promotion, which inspires their associates to follow their example. Hence, the steady increase of our evening roster.

That the management of this corporation has not "laid down" on the Commonwealth to sustain it, even to the extent that foreign governments cheerfully contribute to industrial education, is apparent from the following showing of whence its revenues have been derived: —

TOTAL RECEIPTS OF THE LOWELL TEXTILE SCHOOL FROM
ORGANIZATION TO JAN. 1, 1913.

FOR THE PLANT.

From the Commonwealth,	\$288,331 66
From other sources — manufacturers and others,	391,979 92
	<hr/>
Excess of outside contributions,	\$103,648 26
	<hr/>

FOR MAINTENANCE.

From the Commonwealth,	\$422,500 00
From city of Lowell,	\$138,000 00
From earnings (pupils' fees),	187,557 34
	<hr/>
	325,557 34
	<hr/>
Excess of Commonwealth contributions,	\$96,942 66
	<hr/>

AGGREGATE CONTRIBUTIONS FOR ALL PURPOSES.

From Commonwealth brought down: —

For plant,	\$288,331 66
For maintenance,	422,500 00
	<hr/>
	\$710,831 66
	<hr/>
Total Commonwealth contribution,	\$710,831 66

From other sources: —

For plant,	\$391,979 92
For maintenance,	325,557 34
	<hr/>
	717,537 26
	<hr/>
Excess of outside contributions for all purposes,	\$6,705 60

Respectfully submitted,

TRUSTEES OF LOWELL TEXTILE SCHOOL,

BY A. G. CUMNOCK,
President.

JAMES T. SMITH,
Corporation Clerk.

LOWELL, MASS., Jan. 30, 1913.

APPENDIX.

RESIDENCE OF DAY STUDENTS.

Allston, Mass.,	1	Peabody, Mass.,	1
Andover, Mass.,	5	Roxbury, Mass.,	1
Belmont, Mass.,	1	Salem, Mass.,	1
Billerica, Mass.,	1	Somerville, Mass.,	2
Boston, Mass.,	6	Stoneham, Mass.,	2
Cambridge, Mass.,	4	Taunton, Mass.,	1
Chelmsford, Mass.,	1	Waltham, Mass.,	1
Chicopee Falls, Mass.,	1	Watertown, Mass.,	1
Clinton, Mass.,	1	Wayland, Mass.,	1
Cochituate, Mass.,	1	Webster, Mass.,	1
Concord, Mass.,	1	West Chelmsford, Mass.,	1
Danvers, Mass.,	2	West Medford, Mass.,	1
East Bridgewater, Mass.,	1	West Roxbury, Mass.,	1
Fitchburg, Mass.,	2	Wilmington, Mass.,	1
Gloucester, Mass.,	3	Winchester, Mass.,	3
Groton, Mass.,	1	Worcester, Mass.,	1
Great Barrington, Mass.,	1	Delaware,	1
Haverhill, Mass.,	3	Georgia,	1
Hudson, Mass.,	1	Illinois,	1
Hull, Mass.,	1	Maine,	7
Lancaster, Mass.,	1	Maryland,	1
Lawrence, Mass.,	10	Michigan,	1
Littleton, Mass.,	1	New Hampshire,	7
Lowell, Mass.,	17	New Jersey,	2
Malden, Mass.,	2	New York,	5
Manchester, Mass.,	1	Pennsylvania,	3
Marshfield, Mass.,	1	Rhode Island,	3
Middleborough, Mass.,	1	Texas,	1
Monson, Mass.,	1	St. John, N. B.,	1
North Adams, Mass.,	1		
North Andover, Mass.,	2		
North Cambridge, Mass.,	1		
		Total,	130

PREVIOUS EDUCATION, DAY STUDENTS.

High school or preparatory school,	100	Military academy,	2
College,	4	Philadelphia Textile School,	1
University,	3	Lowell Textile School,	14
Worcester Polytechnic Institute,	1	Municipal School of Technology, Manchester, Eng.,	1
Rindge Manual Training School,	3		
Business college,	1	Total,	130

RESIDENCE OF EVENING STUDENTS.

Lowell, Mass.,	522	Forge Village, Mass.,	2
Lawrence, Mass.,	103	Arlington, Mass.,	1
Andover, Mass.,	13	Chelmsford, Mass.,	1
North Andover, Mass.,	13	Danvers, Mass.,	1
Methuen, Mass.,	13	Graniteville, Mass.,	1
North Chelmsford, Mass.,	10	Haverhill, Mass.,	1
Dracut, Mass.,	7	Tewksbury, Mass.,	1
Boston, Mass.,	5	Winchester, Mass.,	1
Ballardvale, Mass.,	4	Nashua, N. H.,	2
Collinsville, Mass.,	4		
North Billerica, Mass.,	3	Total,	708

OCCUPATION OF EVENING STUDENTS.

Apprentice,	19	Electrical worker,	4
Assistant superintendent,	8	Electrician,	10
Assistant to superintendent,	4	Engineer,	4
Back boy,	2	Filling carrier,	3
Baler,	1	Finisher,	4
Battery boy,	1	Fireman,	4
Belt boy,	1	Fixer,	8
Belt maker,	1	Floor hand,	1
Blacksmith,	1	Florist,	1
Bleacher,	2	Folder,	2
Bobbin boy,	4	Foreman,	5
Bookbinder,	1	Gauger,	1
Bookkeeper,	6	Grinder,	1
Bottler,	2	Harness looker,	5
Brewer,	1	Helper,	19
Butcher,	1	Inspector,	3
Can boy,	1	Insurance agent,	1
Carder,	6	Iron worker,	2
Carpenter,	2	Janitor,	2
Chain builder,	2	Knitter,	4
Chauffeur,	3	Laboratory assistant,	2
Chemist,	5	Laboratory technician,	1
Civil engineer,	1	Laborer,	4
Clerk,	60	Leather worker,	3
Cloth inspector,	5	Lineman,	1
Colorist,	4	Loom fixer,	14
Comberman,	1	Machinist,	52
Compositor,	1	Mechanic,	2
Cone boy,	1	Metal worker,	6
Confectioner,	1	Meter repairer,	1
Cook,	1	Milkman,	1
Cost clerk,	7	Motorman,	1
Creeler,	1	Not employed,	5
Cuff boy,	1	Office boy,	9
Designer,	5	Oil analyst,	1
Doffer,	4	Oiler,	4
Draftsman,	19	Operative,	43
Dresser,	4	Overseer,	13
Druggist,	1	Packer,	1
Dyer,	14	Painter,	1

OCCUPATION OF EVENING STUDENTS — *Concluded.*

Pattern maker,	5	Sorter,	1
Pattern weaver,	6	Spinner,	5
Paymaster,	2	Steam fitter,	5
Pentagrapher,	1	Stenciler,	1
Percher,	1	Stenographer,	1
Photographer,	1	Stone cutter,	1
Polisher,	1	Student,	67
Press hand,	2	Superintendent,	3
Printer,	5	Tailor,	1
Rodman,	2	Teacher,	6
Roll coverer,	2	Teamster,	1
Roving boy,	1	Tester,	3
Rubber worker,	1	Third hand,	4
Salesman,	9	Tool maker,	7
Sampleman,	2	Twister,	2
Second hand,	20	Warp splitter,	2
Section hand,	13	Watchmaker,	1
Shear hand,	1	Weaver,	33
Shipper,	8	Wool sorter,	2
Shoe worker,	17	Worsted drawer,	1
Sizer,	1	Yarn hand,	3
Slasher tender,	1		
Sleeve boy,	1	Total,	708
Solicitor,	1		

TRUSTEES OF THE LOWELL TEXTILE SCHOOL.

(Incorporated, 1895.)

HONORARY TRUSTEES.

FREDERICK FANNING AYER, Esq., New York City.

THE CORPORATION OFFICERS, 1913.

A. G. CUMNOCK, *President.*

JAMES T. SMITH, *Clerk.*

JACOB ROGERS, *Vice-President.*

A. G. POLLARD, *Treasurer.*

TRUSTEES.

On the Part of the Commonwealth of Massachusetts.

Ex officis.

HIS HONOR DAVID I. WALSH,
Lieutenant Governor.

Dr. DAVID SNEDDEN,
Commissioner of Education.

Appointed by the Governor and Council.

FREDERICK A. FLATHER, Lowell, 1916, FRANKLIN W. HOBBS, Brookline, 1914,
Treasurer, Boott Mills. Treasurer Arlington Mills.

On the Part of the City of Lowell.

Ex officis.

HON. JAMES E. O'DONNELL,
Mayor of Lowell.

HUGH J. MOLLOY,
Superintendent of Public Schools.

ANDREW E. BARRETT,
President Municipal Council.

By Appointment of the Lowell Textile Council.

MICHAEL DUGGAN.

PERMANENT TRUSTEES.

ALEXANDER G. CUMNOCK, Lowell, Treasurer, Appleton Company, Boston corporation, mills at Lowell.

EUGENE S. HYLAN, Lowell, Treasurer, New England Bunting Company.

ARTHUR G. POLLARD, Lowell, President, Lowell Hosiery Company.

FREDERIC S. CLARK, Boston and North Billerica, Treasurer, Talbot Mills.

HON. FREDERICK LAWTON, Boston, Justice Superior Court.

JAMES T. SMITH, Lowell, Attorney at Law.

WALTER E. PARKER, Lawrence, Agent, Pacific Mills, Boston corporation, mills at Lawrence.

WILLIAM M. WOOD, Andover, President, American Woolen Company, Boston office, mills at Lawrence, Blackstone, West Fitchburg, Fitchburg, Maynard, Lowell, Plymouth, Webster, Franklin, Uxbridge.

GEORGE E. KUNHARDT, Lawrence and New York, Woolen Manufacturer.

FRANK E. DUNBAR, Lowell, Attorney at Law, and President, Appleton Company, Boston corporation, mills at Lowell.

FRANKLIN NOURSE, Lowell, late Agent, Lawrence Manufacturing Company, Boston corporation, mills at Lowell.

JACOB ROGERS, Lowell, President, Tremont and Suffolk Mills, Boston corporation, mills at Lowell.

CHARLES H. HUTCHINS, Worcester, President, Crompton and Knowles Loom Works.

HENRY A. BODWELL, Andover, Superintendent, Smith and Dove Manufacturing Company, class of 1900.

WILLIAM E. HALL, Lowell, Treasurer, Shaw Stocking Company.

WILLIAM R. MOORHOUSE, Boston, Color Chemist, Cassella Color Company, class of 1901.

CHARLES F. YOUNG, Lowell, Treasurer, Tremont and Suffolk Mills, Boston corporation, mills at Lowell.

JOHN JACOB ROGERS, Lowell, Attorney at Law.

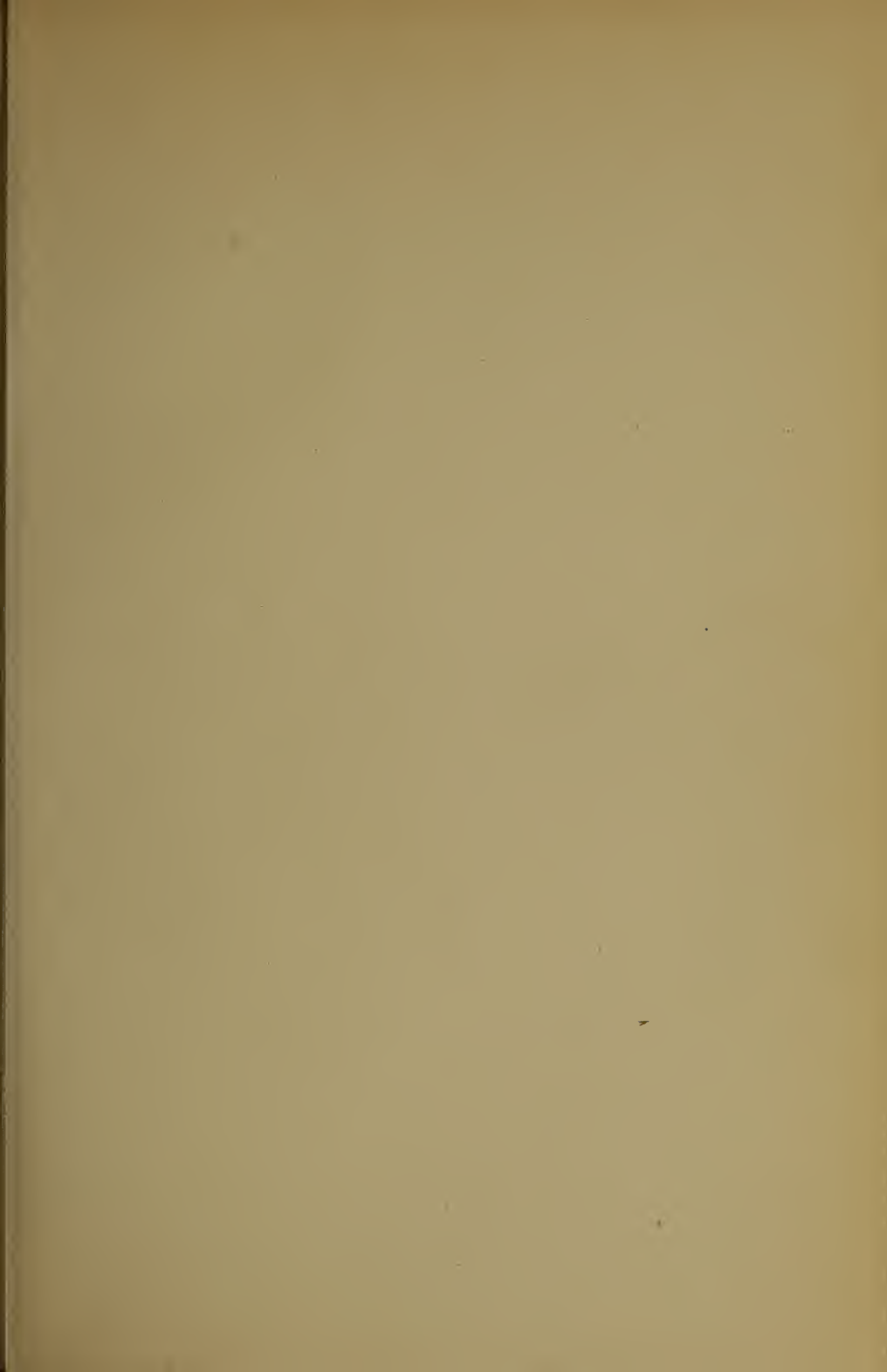
Additional Trustees elected by Alumni under Act of 1905.

For term ending June 30, 1916: DEXTER STEVENS, class of 1904, Yarn Superintendent, Lancaster Mills, Boston corporation, mills at Clinton.

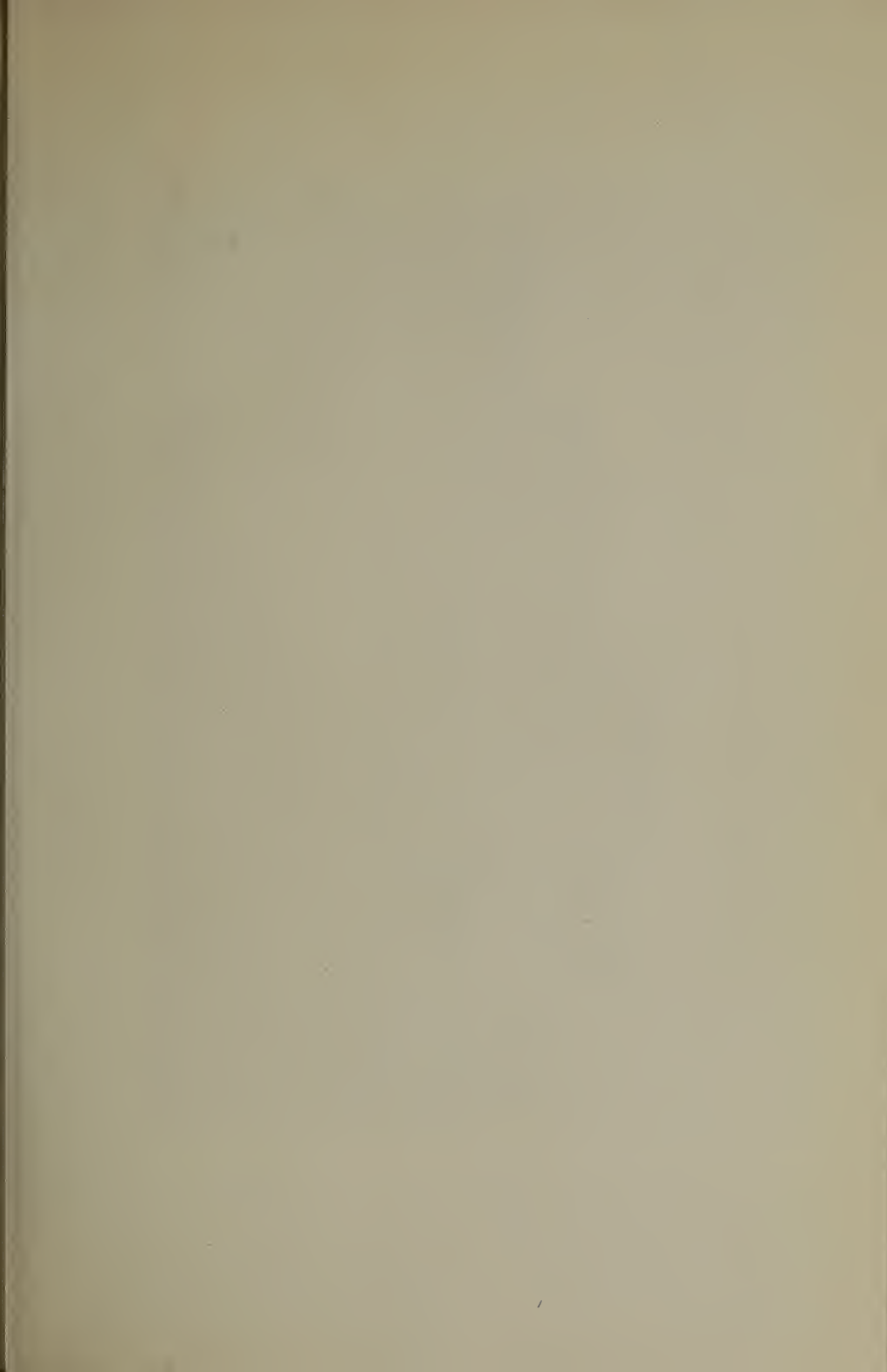
For term ending June 30, 1915: T. ELLIS RAMSDELL, class of 1902, Agent, Monument Mills, Housatonic, Mass.

For term ending June 30, 1914: ROYAL P. WHITE, class of 1904, Superintendent, Stirling Mills, Lowell.

For term ending June 30, 1913: RALPH F. CULVER, class of 1904, with Bancroft Company, Wilmington, Delaware.









SOUTHWICK HALL

COLONIAL AVENUE BUILDING AND
FALMOUTH STREET BUILDING

BULLETIN
OF THE
Lowell Textile School

LOWELL, MASS.

Issued Quarterly

1913 - 1914

Entered August 26, 1902, at Lowell, Mass., as second class matter,
under Act of Congress of July 16, 1894.

Moody Street and Colonial Avenue

CALENDAR

FOR 1913

JANUARY

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FOR 1914

JANUARY

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APRIL

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DECEMBER

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CALENDAR

January—June, 1913

January 25, Sat.	Semi-annual examinations begin.
February 5, Wed.	SECOND TERM begins.
February 22, Sat.	Washington's Birthday—Holiday.
March 12, Wed.	End of first five-week period of second term.
April 16, Wed.	End of second five-week period of second term.
April 17, Thurs. to April 19, Sat. inclusive	Recess.
April 23, Wed.	Certificates awarded to Evening Graduates.
May 22, Thurs.	Final examinations begin.
May 30, Fri.	Memorial Day—Holiday.
June 6, Fri.	Diplomas awarded to Day Graduates.
June 18-20, Wed. to Fri.	First entrance examinations.

September, 1913—June, 1914

September 9 and 10, Tues. and Wed. 9 A. M.	Second entrance examinations.
September 12, Fri.—9 A. M.	Re-examinations and examinations for advanced standing begin.
September 18, Thurs.—7 P. M.	Entrance examinations for evening students begin. They will be held on Thursday evenings until opening of classes.
September 29, Mon.	DAY SCHOOL YEAR begins.
Sept. 29, Mon.	Evening school year begins.
October 13, Mon.	Columbus Day—Holiday.
November 1, Sat.	End of first five-week period of first term.
November 26, Wed. to November 29, Sat. inclusive.	Thanksgiving Recess.
December 6, Sat.	End of second five-week period of first term.
December 24, Wed. to January 3, Sat. inclusive.	Christmas Recess.
January 26, Mon.	Semi-annual examinations begin.
February 4, Wed.	SECOND TERM begins.
February 23, Mon.	Washington's Birthday—Holiday.
March 11, Wed.	End of first five-week period of second term.
April 15, Wed.	End of second five-week period of second term.
April 17, Fri. to April 20, Mon. inclusive	Recess.
May 6, Wed.	Certificates awarded to Evening Graduates.
May 20, Wed.	Final examinations begin.
May 30, Fri.	Memorial Day—Holiday.
June 5, Fri.	Diplomas awarded to Day Graduates.
June 15 and 16, Mon. and Tues. 9 A. M.	First entrance examinations.

September, 1914—January, 1915

September 8 and 9, Tues. and Wed. 9 A. M.	Second entrance examinations.
September 11, Fri.—9 A. M.	Re-examinations and examinations for advanced standing begin.
September 17, Thurs. 7 P. M.	Entrance examinations for evening students begin. They will be held on Thursday evenings until opening of classes.
September 28, Mon.	DAY SCHOOL YEAR begins.
Sept. 28, Mon.	Evening school year begins.
October 12, Mon.	Holiday in observance of Columbus Day.
October 31, Sat.	End of first five-week period of first term.
November 25, Wed. to November 28, Sat. inclusive	Thanksgiving Recess.
December 5, Sat.	End of second five-week period of first term.
December 23, Wed. to January 2, Sat. inclusive	Christmas Recess.



KITSON HALL AND CAMPUS

SOUTHWICK HALL

Trustees of the Lowell Textile School

(Incorporated 1895)

Honorary Trustee

FREDERICK FANNING AYER,
New York City

The Corporation

Officers, 1913

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JACOB ROGERS, Vice-President ARTHUR G. POLLARD, Treasurer

Trustees

On the part of the Commonwealth of Massachusetts

Ex Officiis

HIS HONOR DAVID I. WALSH
Lieutenant Governor

DR. DAVID SNEDDEN
Commissioner of Education

Appointed by the Governor and Council

FREDERICK A. FLATHER, Lowell, 1916 FRANKLIN W. HOBBS, Brookline, 1914
Treasurer Boott Mills Treasurer Arlington Mills

On the part of the City of Lowell

Ex Officiis

HON. JAMES E. O'DONNELL
Mayor of Lowell

HUGH J. MOLLOY
Superintendent of Public Schools

ANDREW E. BARRETT
President Municipal Council

By Appointment of the Lowell Textile Council

MICHAEL DUGGAN

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FRANKLIN NOURSE, Lowell, Late Agent, Lawrence Manufacturing Company, Boston Corporation, Mills at Lowell.
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HENRY A. BODWELL, Andover, Superintendent, Smith and Dove Manufacturing Company. Class of 1900.
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WILLIAM R. MOORHOUSE, Boston, Color Chemist, Cassella Color Company. Class of 1901.
CHARLES F. YOUNG, Lowell, Treasurer, Tremont and Suffolk Mills, Boston Corporation, Mills at Lowell.
JOHN JACOB ROGERS, Lowell, Attorney-at-law.

Additional Trustees Elected by Alumni Under Act of 1905

For Term Ending June 30, 1916:

DEXTER STEVENS, Class of 1904, Vice-President and General Manager, Necrousett Mills, Philadelphia, Penn.

For Term Ending June 30, 1915:

T. ELLIS RAMSDELL, Class of 1902, Agent, Monument Mills, Housatonic, Mass.

For Term Ending June 30, 1914:

ROYAL P. WHITE, Class of 1904, Superintendent, Stirling Mills, Lowell.

For Term Ending June 30, 1913:

RALPH F. CULVER, Class of 1904, Manager of Dyeing Department, Bancroft Co., Wilmington, Del.



GENERAL VIEW OF SCHOOL, MERRIMACK RIVER

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BUILDING AND LEGISLATIVE

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FRANKLIN NOURSE, Chairman

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T. ELLIS RAMSDELL

DENTER STEVENS

Woolen and Worsted Spinning

FRANKLIN W. HOBBS, Chairman

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FRANKLIN NOURSE

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ROYAL P. WHITE



ASSEMBLY HALL

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WALTER B. HOLT, Bursar

STELLA MORRILL, Registrar

CECELIA A. SMALL, Secretary

FLORENCE M. LANCEY, Librarian

CHIEFS OF DEPARTMENTS

LOUIS A. OLNEY, S. B., M. S.,

Professor of Chemistry; in charge of Department of
Chemistry and Dyeing

EDGAR H. BARKER,

In charge of Department of Woolen and Worsted
Yarns

GEORGE H. PERKINS, S. B.,

In charge of Department of Textile Engineering

ARTHUR A. STEWART,

In charge of Department of Finishing

STEPHEN E. SMITH,

In charge of Department of Cotton Yarns and
Knitting

HERMANN H. BACHMANN,

In charge of Department of Textile Design and Power
Weaving

INSTRUCTORS

JOSEPH WILMOT,

Instructor in Power Weaving and Warp Preparation

JOHN N. HOWKER,

Instructor in Wool Sorting and Scouring

STEWART MACKAY,

Instructor in Textile Design and Cloth Analysis

ROBERT R. SLEEPER,

Instructor in Dyeing

HERBERT J. BALL, S. B.,

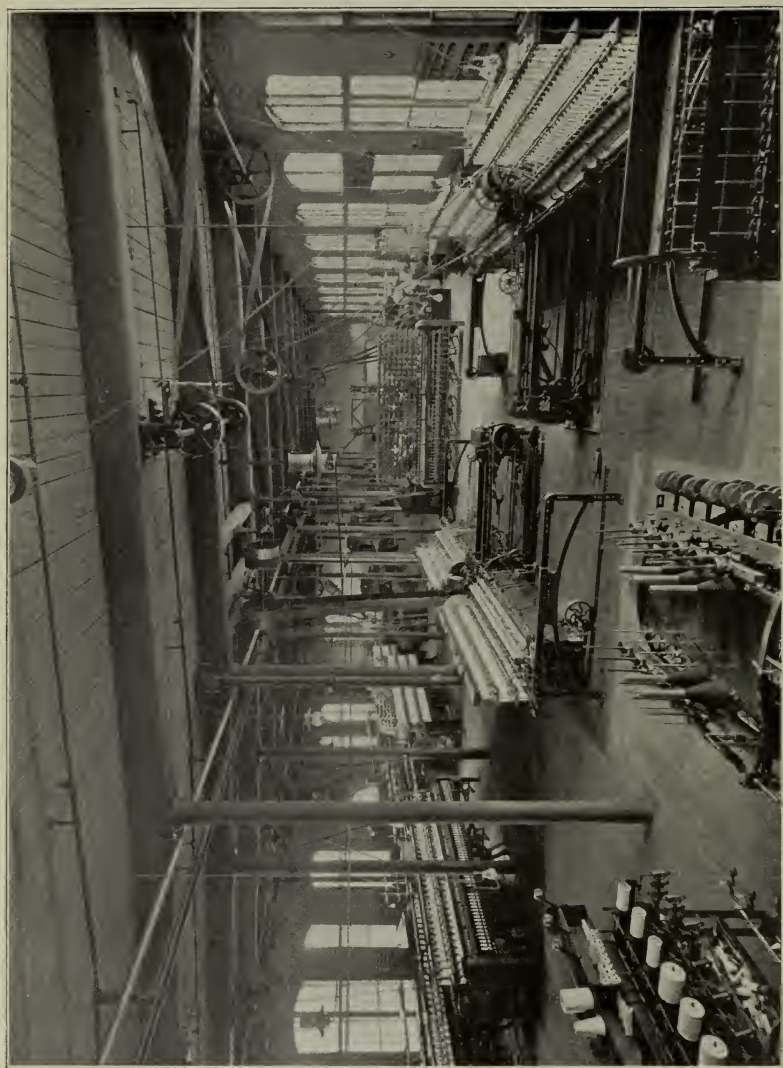
Instructor in Mechanical Engineering

EUGENE C. WOODCOCK,

Instructor in Woolen and Worsted Yarns

E. ELIZABETH WHITNEY,

Instructor in Freehand Drawing



COTTON YARN DEPARTMENT

INSTRUCTORS—CONTINUED

- ULYSSES J. LUPIN, S. B.,
Instructor in Mathematics, Physics and Electrical
Engineering
- MILES R. MOFFATT, S. B.,
Instructor in Chemistry
- HOWARD D. SMITH, PH. D.,
Instructor in Chemistry
- LLOYD VAN DOREN, PH. D.,
Instructor in Chemistry
- ALBERT E. MUSARD,
Instructor in Jacquard Weaving
- JOHN C. LOWE,
Instructor in Woolen and Worsted Yarns
- HERBERT C. WOOD,
Instructor in Cotton Yarns
- LESTER H. CUSHING, A. B.,
Instructor in Commercial Languages, English and
History
- CHARLES H. JACK,
Instructor in Machine Shop Practice
- HENRY K. DICK,
Instructor in Knitting and Cotton Yarns
- RALPH E. GUILLow,
Instructor in Physical Culture
- STARR H. FISKE,
Assistant Instructor in Weaving
- RUSSELL B. STODDARD, A. B.,
Assistant Instructor in Chemistry
- DAVID M. HUNTING, S. B.,
Assistant Instructor in Mechanical Drawing
- HAROLD W. LEITCH,
Assistant Instructor in Chemistry
- WARREN H. WHITEHILL,
Assistant Instructor in Dyeing
- ARCHIBALD R. GARDNER, M. D.,
Medical Adviser

FACULTY

CHARLES H. EAMES

LOUIS A. OLNEY

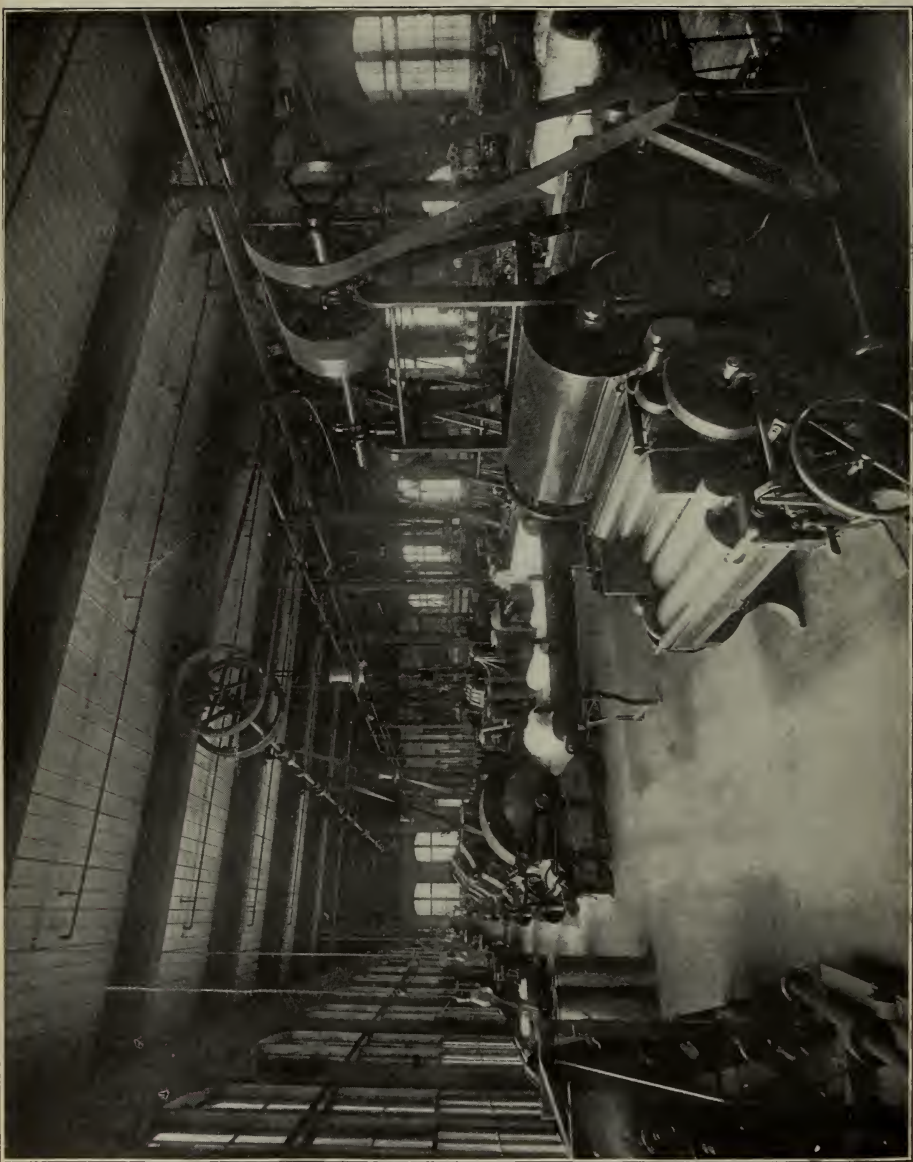
STEPHEN E. SMITH

EDGAR H. BARKER

ARTHUR A. STEWART

GEORGE H. PERKINS

HERMANN H. BACHMAN



COTTON YARN DEPARTMENT

The Lowell Textile School

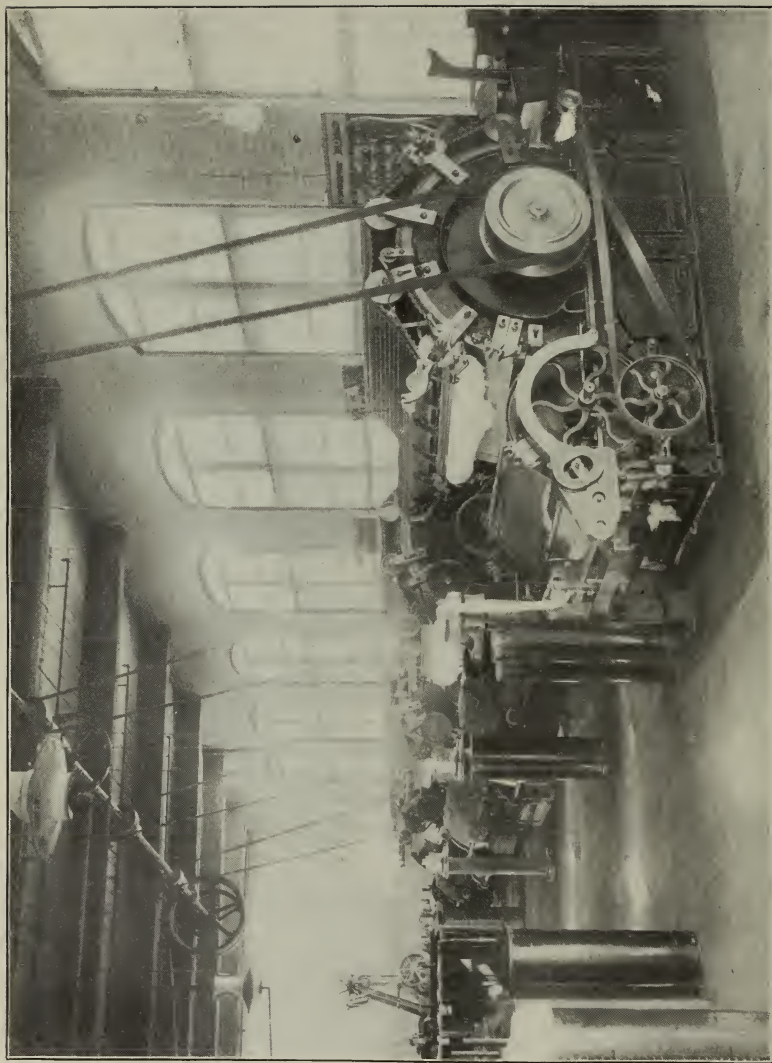
The Lowell Textile School was established, and is managed, by the Trustees of the Lowell Textile School of Lowell, Massachusetts, "for the purpose of instruction in the theory and practical art of textile and kindred branches of industry," as set forth in the act of incorporation.

The movement for the establishment of the School dates from June 1, 1891, but it was not opened for instruction until February 1, 1897.

Not only did the normal progress of the textile industry require such a school, but through the rapid development of the manufacture of the coarser cotton fabrics in the southern states, a crisis had arrived in the leading industry of New England which could only be met by wider and more thorough application of the sciences and arts for the production of finer and more varied fabrics.

Modeled on the lines of the departments of the higher Polytechnic Institutes, it offers thorough instruction in the elements and principles of the sciences and arts applicable to textile and kindred branches of industry and also in their application to the manufacturing of all varieties of textile fabrics, and the machinery required therefor.

In industrial education the distinction between Trade and Technical Industrial Schools is coming to be understood. The Lowell School belongs to the latter class. Beginning with limited equipment, instructing staff, and means, instruction at first was by Mill or Trade school methods—the pupil was brought directly to the machine, its parts explained to him, and its operation in manufacturing. The curriculum was, however, rapidly extended, as contemplated in the original plan, department after department opened and equipped, and commodious and well adapted buildings provided for a permanent home.



COTTON CARDING

While the progress of invention and the demands of ever changing markets will compel constant improvement in methods and additions to the very extensive equipment, the period of establishment is substantially closed. All departments are open for instruction in all branches of the textile art under extensive and able corps of instructors and assistant instructors.

Of the incorporators the permanent trustees (limited to twenty) are mainly representatives, as president, treasurer, agent, or superintendent, of the management of great textile or textile machine corporations of the Commonwealth, and associated with them are, *ex officio*, His Honor, the Lieutenant Governor and the Commissioner of the State Board of Education, and two trustees appointed for four-year terms by the Governor and Council. Also the Mayor, the President of the Municipal Council, the Superintendent of Schools, and a representative of the textile council of the city of Lowell. At the session of 1905 the Legislature authorized the graduates of the school to elect two additional trustees, and by an act of 1906 the number was increased to four for four-year terms, one being elected each year.

By the terms of the by-laws at least three-fourths of the permanent trustees must be persons "actually engaged in or connected with textile or kindred manufactures."

Lowell, Massachusetts is called the "Mother Textile City of America," and in locating the school at this center a considerable advantage is secured for the reason that every commercial fibre is utilized in the products of the great Merrimack Valley Textile district. The practical work of the school is therefore kept closely in touch with the several branches of the industry which are included in the courses of study.

His Excellency, Governor Roger Wolcott, formally opened the school on January 30, 1897, there being present a large and representative gathering of men from the textile industries in all portions of New England. The regular classes of the school were opened on February 1, 1897, and have been regularly conducted since that time.

His Excellency, Governor John L. Bates, dedicated the buildings forming the permanent home of the school on February 12,



COTTON COMBING

1903, in the presence of a large number of guests representing the Legislature as well as the educational, textile, and commercial interests of the Commonwealth.

The day classes have been organized for those who can devote their entire time for three or more years to the instruction requisite in preparing to enter the textile industries. It has been found necessary to require of all such students educational qualifications equivalent to those given by a regular four year course of a high school or academy of good standing.

For those who are unable to attend the day courses classes are held for about twenty weeks of the year in the evening. The courses then given are similar to those of the day, but are aimed especially to meet the needs of those working during the day in the mills and shops. For entrance to these classes an applicant should have the equivalent of a grammar school education.

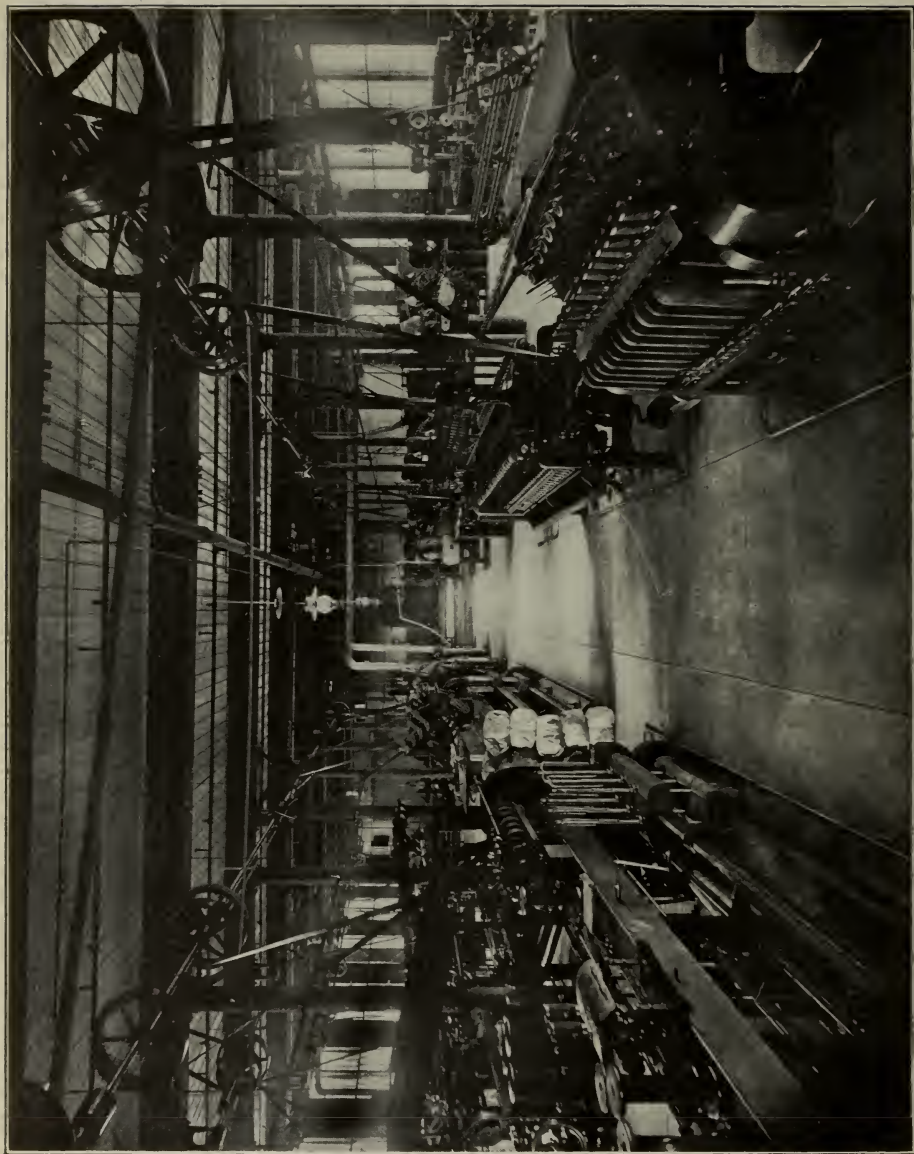
The school has so advanced in the standard and character of its work, as well as the standard for admission to its day classes, that upon application to the Legislature of the State of Massachusetts permission was given to the school to grant the degrees of Bachelor of Textile Engineering (B. T. E.) and Bachelor of Textile Dyeing (B. T. D.) upon the satisfactory completion of prescribed four year courses.

The mechanical equipment of the school includes the best makes of textile machinery, and these machines, while built as they would be for regular work, are, as far as possible, adapted to the experimental work which is of particular value in such an institution as this.

There is a more varied equipment in this school than in any other, either in America or Europe, and it is now possible to convert the raw stock into the finished fabric, within the school.

The growth of the school has been constant, as is evident from the fact that when it was opened February 1, 1897, there were 32 day and 110 evening pupils. January 1, 1913, the roster showed 130 day pupils and 708 evening pupils or 838 in all.

On January 1, 1903, the School was transferred from the rented quarters that it had occupied for five years to the site and building where it is permanently located.



WOOLEN AND WORSTED YARN DEPARTMENT

The site is a commanding one, consisting of about fifteen acres at a high elevation, on the west bank of the Merrimack River, extending to and overlooking the rapids of Pawtucket Falls, the first to be utilized for power weaving in America on an extensive scale. This site was contributed by Frederick Fanning Ayer, Esquire, of New York City, and the Proprietors of the Locks and Canals on the Merrimack River. The buildings consist of Southwick Hall, Kitson Hall, the Falmouth Street Building and Colonial Avenue Laboratories, with a power plant east of the Falmouth Street Building.

Southwick Hall was contributed by the Commonwealth of Massachusetts and Frederick Fanning Ayer, Esquire, of New York City, and is a memorial to Royal Southwick, a leading textile manufacturer, a public man of earlier days, and a maternal ancestor of Mr. Ayer. It includes a central mass 90 x 90 ft., having three stories and two wings 80 x 85 ft. with two stories and a well lighted basement. The building is pierced in the center by an arched way from which access is had to the wings and to the central courtyard. The northern wing is occupied by the General Offices, Engineering and Finishing Departments, and Library, while the southern wing is entirely occupied by the Chemistry and Dyeing Departments. In the basement is located an Industrial Chemistry Laboratory for the manufacture of dyes from the crude material.

Kitson Hall, dedicated to the memory of Richard Kitson, was contributed by Charlotte P. Kitson and Emma K. Stott, his daughters; the Kitson Machine Company of Lowell, founded by Mr. Kitson, was also a generous contributor.

This hall makes a right angle with Southwick Hall, is 60 feet by 252 feet and has one story and a basement. The first floor is occupied by the Cotton Yarn and Knitting Departments, while the basement contains the Mechanical Engineering Laboratory, Machine Shop, also Students' Locker and Recreation Rooms.

Since the erection of this building the northeast portion has been occupied by the power and heating plant, but during the coming summer it is proposed to move this into the new building recently erected in the rear of the school buildings.



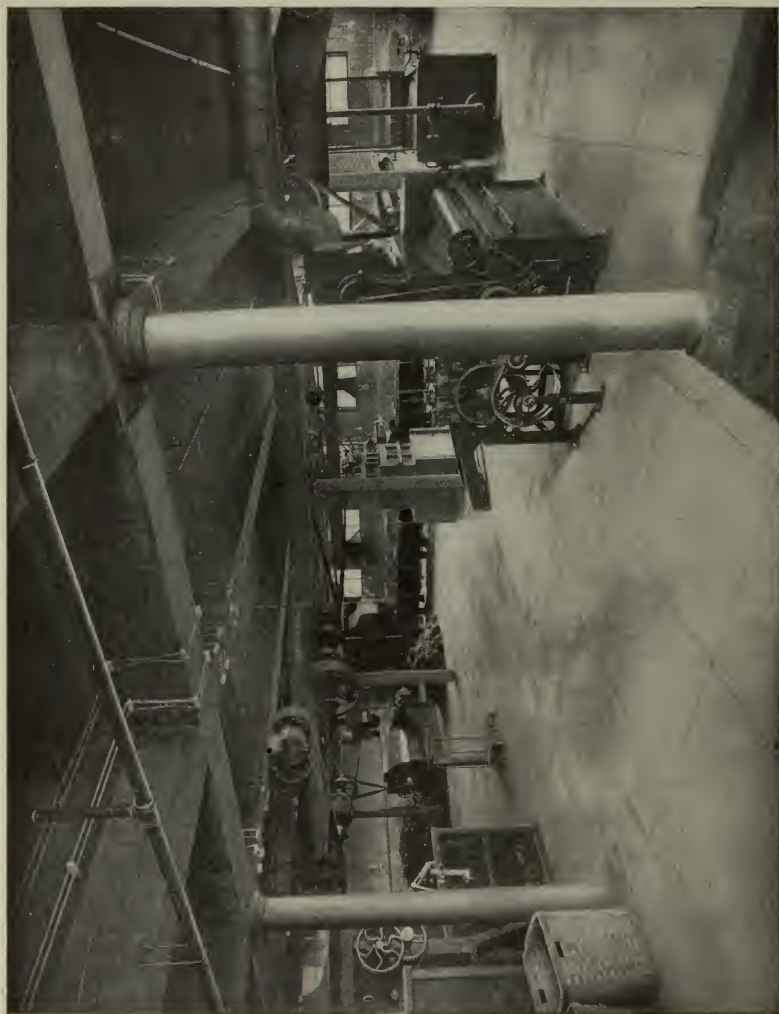
WOOL SORTING

The Falmouth Street Building forms the third side of the quadrangle and consists of two portions, one 75 x 130 ft., three stories, and the head house 70 x 80 ft., three stories and basement. One portion of this building is occupied by the Departments of Weaving and Woolen and Worsted Yarns; the other, the head house, also is occupied by these departments, and contains equipment for French Spinning, Warp Preparation, Wool Scouring, Carbonizing and Conditioning; the upper floor contains the Textile Design Department. The building was erected by funds given by the Commonwealth and a private donor.

Colonial Avenue Building was erected in the summer of 1910 from plans prepared by the Engineering Department. The work of construction was also in charge of the engineers of this department. The building completes the fourth side of the quadrangle and in outward appearance corresponds to the architectural features of the other school buildings. It is a single story building and has the dimensions of 195 x 60 ft. Its interior is faced with cement brick made at the school during the progress of the work. These serve to give light reflecting walls which are advantageous for the work of the Wool Manufacturing, Cotton Finishing and Chemistry and Dyeing Departments that occupy this building. The funds for this building were provided by the state of Massachusetts.

The buildings are all faced on the exterior with light brick with granite and Indiana limestone trimmings. They are of modern mill construction adapted to educational uses. The floor space of the several departments is as follows:

Cotton Yarns and Knitting	12,000 sq. ft.
Woolen and Worsted Yarns	28,160 " "
Textile Design and Decorative Art	16,806 " "
General Chemistry and Dyeing Laboratories	28,400 " "
Finishing	5,806 " "
Power Weaving	15,360 " "
Textile Engineering	15,729 " "
Power Plant	5,000 " "
Assembly and Physical Culture Halls.....	10,800 " "
Entrances, corridors, stairways, etc.	14,487 " "



WOOL SCOURING AND CARBONIZING

The additional floor space is devoted to Administration Offices, Library, Assembly Halls, Class Rooms, Store Rooms, etc.

Though from the first the management has kept in view the clearly defined objective which called for the establishment of the school, namely, the needs of the textile and kindred industries, it has developed its curriculum, its instruction methods, and equipment as those needs arose or became evident. At this writing its chemical and dyeing, decorative art, design, yarn and weaving departments are liberally housed, equipped, and provided with able instructors for the highest efficiency, though additional floor space is required and is being provided as the roster of pupils increases. The demand for a very large addition to the mechanical, machine shop, and power production and application branches embraced by the title "Textile Engineering" was supplied in 1908. During the past year an extensive equipment for finishing cotton fabrics has been installed in the Colonial Avenue Building.

EQUIPMENT

The equipment of machinery, inventoried January 1, 1913, at \$240,692.31, is most varied for textile educational purposes, and is being constantly augmented. The builders of the various machines installed keep in close touch with the school, adding to the machines such improvements as are made from time to time, and each year some new machine will be added by a manufacturer who finds it to his advantage to be represented here. This operates to mutual advantage of student and manufacturer.

COTTON DEPARTMENT

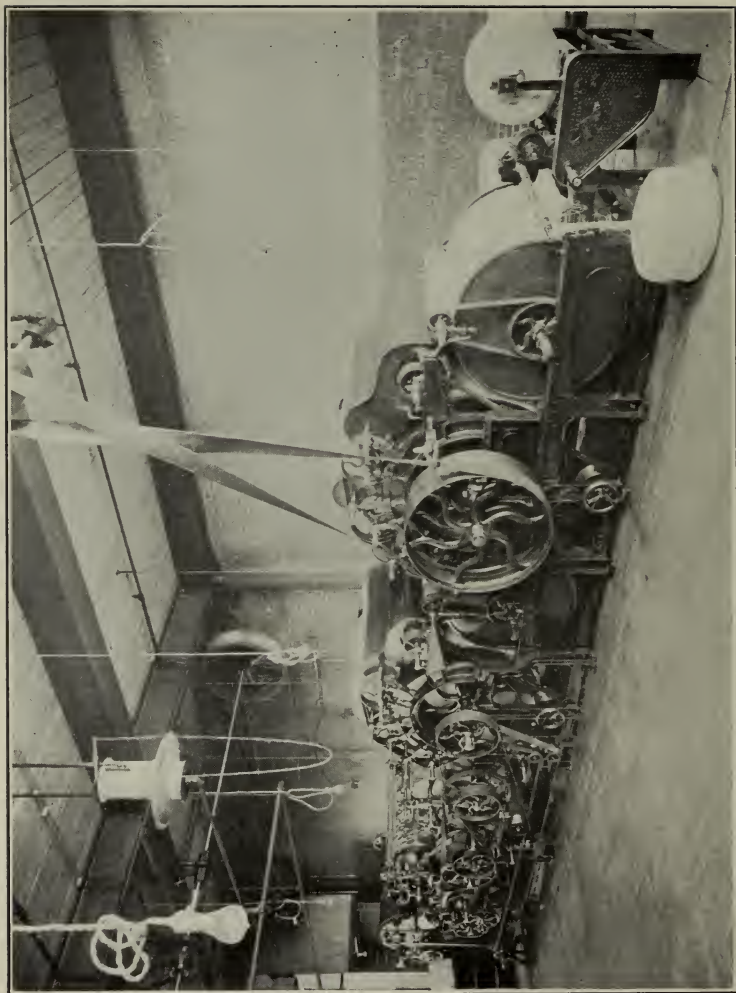
Ginning

- One 50 saw gin made by Daniel Pratt Gin Co., Prattsville, Ala.
- One Prior Roller Gin.

Opening, Picking and Waste Machinery

An outfit of Kitson Picking Machinery from works of Saco-Lowell Shops, Lowell, Mass., including:

- One No. 7 Opener with Automatic Feeder connected by Perham patent Cleaning Trunk to
- One 40 in. Single Beater Breaker Lapper with Condenser and gauge box feed.



WORSTED CARD

- One 40 in. Single Beater Intermediate Finisher Lapper with Perham & Davis Sectional Plate Evener, apron to double four laps.
- One 40 in. Single Beater Finisher Lapper with Perham & Davis Sectional Plate Evener, apron to double four laps, Kirschner Patent Carding Beater.
- One Roving Waste Opener.
- One Thread Extractor.

Carding, Combing and Drawing

The following machinery made by the Saco-Lowell Shops, Lowell, Mass.

- One Top Flat Card.
- Three Revolving Flat Cards.
- Two Railway Heads.
- Two Drawing Frames.

One of these cards is equipped with the Chapman Electric Neutralizer, made by the Chapman Electric Neutralizer Co., Portland, Me.

From Saco-Lowell Shops
Stripping Rolls, etc.

From the Whitin Machine Works, Whitinsville, Mass.

- One 40 in. Revolving Flat Card.
- Card Grinding Rolls.
- One Sliver Lapper.
- One Six Head Ribbon Lapper.
- One Four Head Ribbon Lapper.
- One Six Head Comber.
- One Eight Head High Speed Comber.

From the Mason Machine Works, Taunton, Mass.

- One Sliver Lap Machine.
- One Comber.

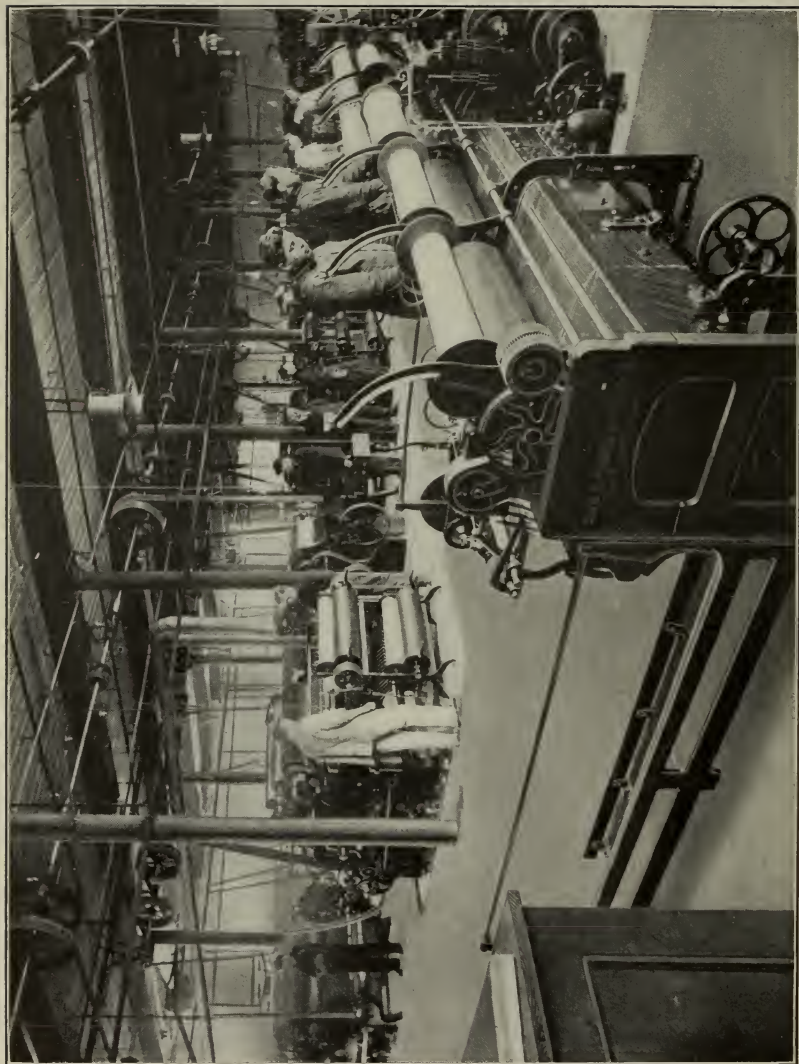
Roving, Spinning and Twisting

From Saco-Lowell Shops, Lowell, Mass.

- One Slubber.
- One Intermediate.
- One Fine Frame.
- One Jack Frame.
- Three Ring Spinning Frames.
- One Spinning Mule.
- One Spooler.
- One Wet and Dry Twister.

From Fales & Jenks, Pawtucket, R. I.

- One Wet and Dry Twister.



WOOLEN YARN DEPARTMENT

From Draper Company, Hopedale, Mass.

One Wet and Dry Twister.

From Whitin Machine Works, Whitinsville, Mass.

Two Ring Spinning Frames.

From Woonsocket Machine and Press Co., Woonsocket, R. I.

One Intermediate Fly Frame.

From Asa Lees Co., Oldham, England, Wm. Firth Company, Agents.

One Mule for fine spinning.

Miscellaneous Machinery of this Department includes:

From the Saco-Lowell Shops, Lowell, Mass.

One Reel.

One Model Fine Fly Frame.

One Model Fly Frame Compound.

One Model Card Feed.

One Model Flat Grinding Device.

One Model Scroll Setting Device.

From The Universal Winding Company, Providence, R. I.

One Six Head Universal Winder, for cones, tubes or multiple winding.

From George W. Payne Co., Pawtucket, R. I.

One 12 Spindle Cone Winder.

From Draper Company, Hopedale, Mass.

One Weeks Banding Machine.

One Moscrop Single Thread Testing Machine.

Miscellaneous Machines.

One Yarn Inspection Machine with blackboards.

Two Barbour Knotters.

Two Yarn Reels and Grain Scales.

One Power Yarn Tester.

One Twist Counter.

From Howard Brothers, Worcester, Mass.

One Exhibition Board of Hand Cards.

One Exhibition Board of Card Clothing.

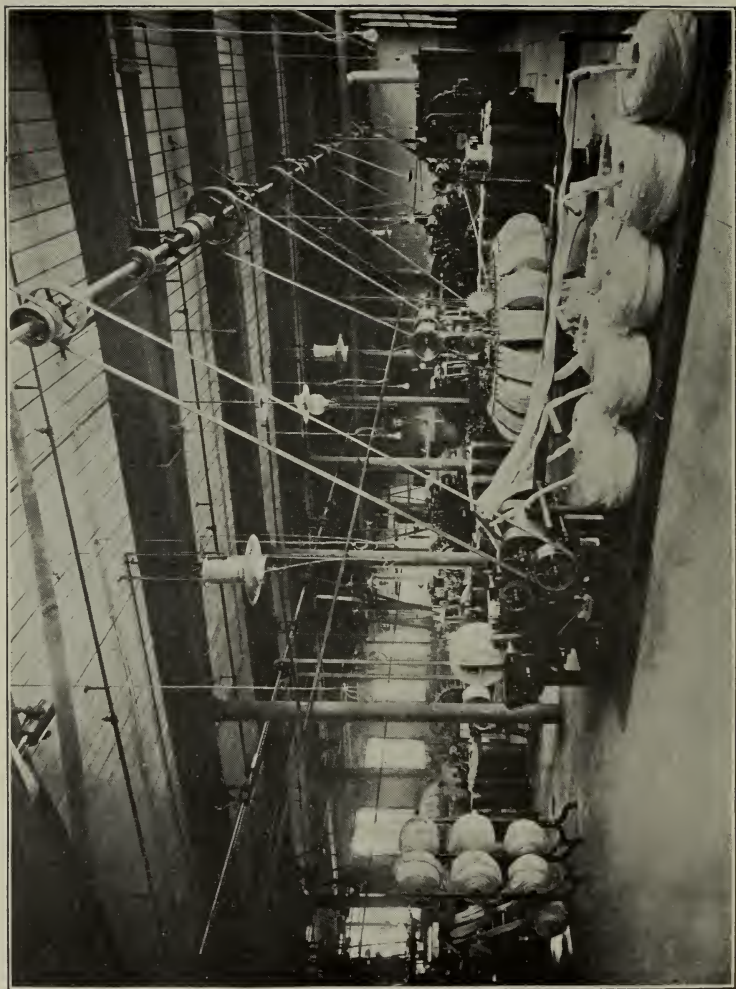
Knitting Department

One Mayo "Acme" Full Automatic Seamless Knitting Machine from Mayo Knitting Machine and Needle Co., Franklin Falls, N. H.

One Mayo "Acme" Full Automatic Knitting Machine with lace front attachment from Mayo Knitting Machine and Needle Company, Franklin, N. H.

One George D. Mayo Full Automatic Seamless Knitting Machine from George D. Mayo Machine Co., Laconia, N. H.

One George D. Mayo Full Automatic Knitting Machine with yarn changer and striper from George D. Mayo Machine Co., Laconia, N. H.



WOOL COMBING

- One Brinton Full Automatic Seamless Knitting Machine from H. Brinton Company, Philadelphia, Pa.
- One Brinton 200 Needle Ribber with clearing course attachment from H. Brinton Company, Philadelphia, Pa.
- One Brinton Rib Knitting Machine with Knee and Ankle Splicer and Plater from H. Brinton Co., Philadelphia, Pa.
- One McMichael and Wildman Rib Top Knitting Machine from Wildman Mfg. Company, Norristown, Pa.
- One Wildman Rib Knitting Machine, with Knee and Ankle Splicer and Automatic Stop Motion, Wildman Mfg. Co., Norristown, Pa.
- One Wildman Rib Top Machine with Automatic Stop Motion from Wildman Mfg. Company, Norristown, Pa.
- One Wildman Rib Knitting Machine with stripping automatic tucking attachment and Stop Motion from Wildman Mfg. Co., Norristown, Pa.
- One Branson Stocking Machine from Branson Knitting Machine Co., Philadelphia, Pa.
- One Banner Knitting Machine with splicing and plating attachments from the Hemphill Mfg. Co., Pawtucket, R. I.
- One Scott & Williams New Automatic Half-hose from Scott & Williams, Philadelphia, Pa.
- One Scott & Williams Ribbed Underwear Machine.
- One Crane 19 in. cylinder Flat Web Machine from Crane Mfg. Co., Lakeport, N. H.
- One Crosser, One Section Jacquard Machine from Grosser Knitting Machine Company, N. Y.
- One Grosser two thread Looper for fine work from Grosser Knitting Machine Company, New York.
- One Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Lamb Glove Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One 24 inch Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Beattie Looper from Beattie Machine Works, Cohoes, N. Y.
- One Hepworth Looper with trimming attachment from J. W. Hepworth and Co., Philadelphia, Pa.
- Five Sewing Machines, including two Shell Stitch Machines and three 2- and 3-thread Overseaming and Crocheting Machines, from Merrow Machine Co., Hartford, Conn.
- Five Sewing Machines, including machines for Overseaming, Double Stitch Covering, Seaming and Welting, Vest Finishing, etc., from Union Special Sewing Machine Co., Boston, Mass.



FRENCH SPINNING

WOOLEN AND WORSTED DEPARTMENT

Wool Sorting and Grading

This department is thoroughly equipped with benches, baskets, etc., for sorting wool in a convenient manner, and in addition there are samples of all grades and types of wool and other fibres.

Scouring and Carbonizing

Wool Scouring Machinery, C. G. Sargent's Sons Corp., Graniteville, Mass., consisting of

Cone Duster for Grease Wool.

Two Scouring Bowls, each 17 ft. x 24 in., with Parallel Rakes.

One Automatic Feeder for Scouring Bowls.

One Automatic Feeder for Dryer.

One Single Apron Dryer.

Carbonizing Screw Acid Tank.

Carbonizing Duster, with Crush Rolls.

From North Chelmsford Machine Co.

One Rinse Box.

From Schaum & Uhlinger, Philadelphia, Pa.

One Hydro-Extractor.

From C. S. Dodge, Lowell, Mass.

One Shoddy Picker.

One Bagging Stand.

Woolen

Picking

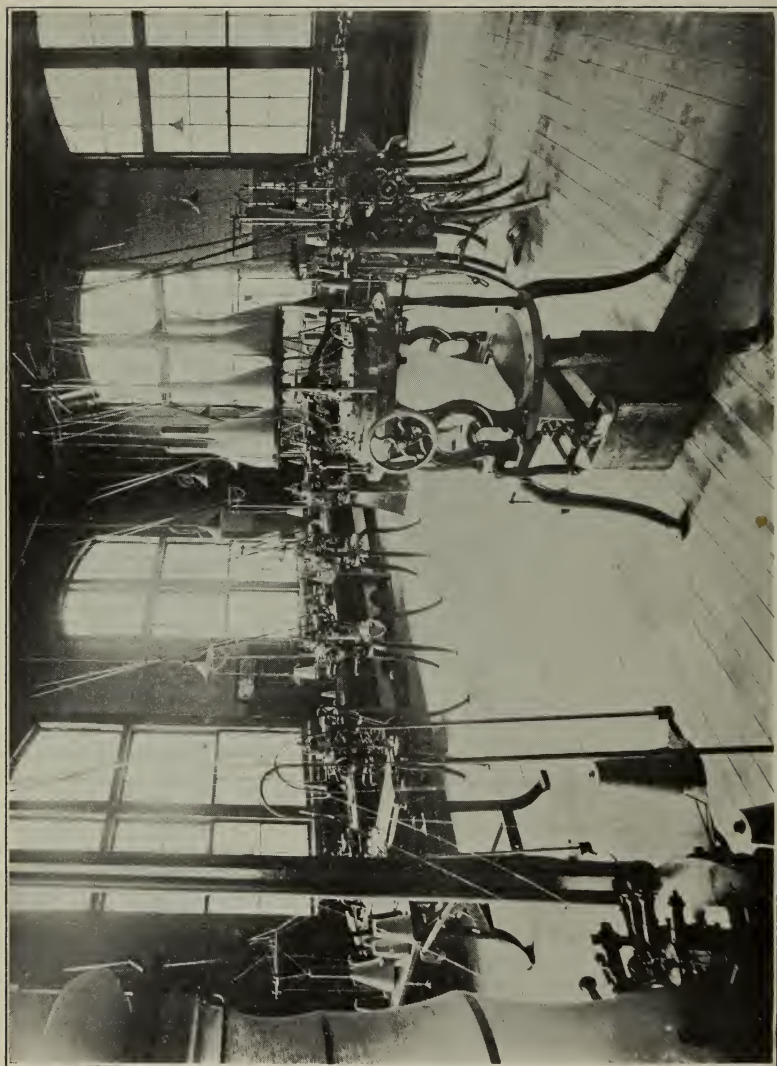
One Parkhurst Burr Picker, Atlas Mfg. Co., Newark, N. J.

One Mixing Picker, Davis & Furber Machine Co., North Andover, Mass., equipped with Improved Mixing Picker Feed, and Spencer Oiler, both made by George S. Harwood & Son, Boston, Mass.

Carding

One set of Woolen Cards, including:

First Breaker, Second Breaker and Finisher, Davis & Furber Machine Co., North Andover, Mass.; this set of cards equipped with Bramwell First Breaker Feed, (George S. Harwood & Son, Boston, Mass.); Torrance Balling Head and Creel, (Torrance Mfg. Co., Harrison, N. J.) between First Breaker and Second Breaker; Apperly Feed, (George S. Harwood & Son, Boston, Mass.) between Second Breaker and Finisher, and Combination Rub Rolls and Apron Condenser, (Davis & Furber Machine Co., North Andover, Mass.), on Finisher. These cards are for medium or coarse work.



KNITTING DEPARTMENT

One set of Davis & Furber Woolen Cards, including:

First Breaker, Second Breaker and Finisher. This set of cards equipped with Bramwell First Breaker Feed, (George S. Harwood & Son, Boston, Mass.); Apperly Feed with Kemp Traveller, (George S. Harwood & Son, Boston, Mass.), between First Breaker and Second Breaker; Bates Feed (E. V. Bates, Lowell, Mass.), between second Breaker and Finisher, and Davis & Furber Double Apron Condenser, on Finisher. These cards are for fine work.

Both sets of cards are equipped with Chapman Electric Neutralizer, made by Chapman Electric Neutralizer Co., Portland, Me.

One Sample Mixing Card, Torrance Mfg. Co., Harrison, N. J.

Spinning

One Spinning Mule, 120 spindles, Davis & Furber Machine Co., North Andover, Mass.; Bobbin Holders, supplied by American Bobbin Holder Co., W. Medway, Mass.

One Spinning Mule, 120 spindles, Johnson & Bassett, Worcester, Mass.; Bobbin Holders supplied by Murdock & Geb, Franklin, Mass.

One 1907 Fancy Yarn Twister, 20 spindles, Davis & Furber Machine Co., North Andover, Mass.

Card Grinding

One Roy Grinding Frame, B. S. Roy & Son, Worcester, Mass.

Two Roy Traverse Grinders, B. S. Roy & Son, Worcester, Mass.

One Entwistle Traverse Grinder, T. C. Entwistle Co., Lowell, Mass.

One Complete set of Carder's Tools, W. H. Brown, Worcester, Mass.

Worsted

Carding

One 50-inch Double-cylinder Worsted Card (4 lickerin), Davis & Furber Machine Co., North Andover, Mass., equipped with Bramwell Feed, George S. Harwood & Son, Boston; also equipped with a Chapman Electric Neutralizer, Chapman Electric Neutralizer Co., Portland, Me.

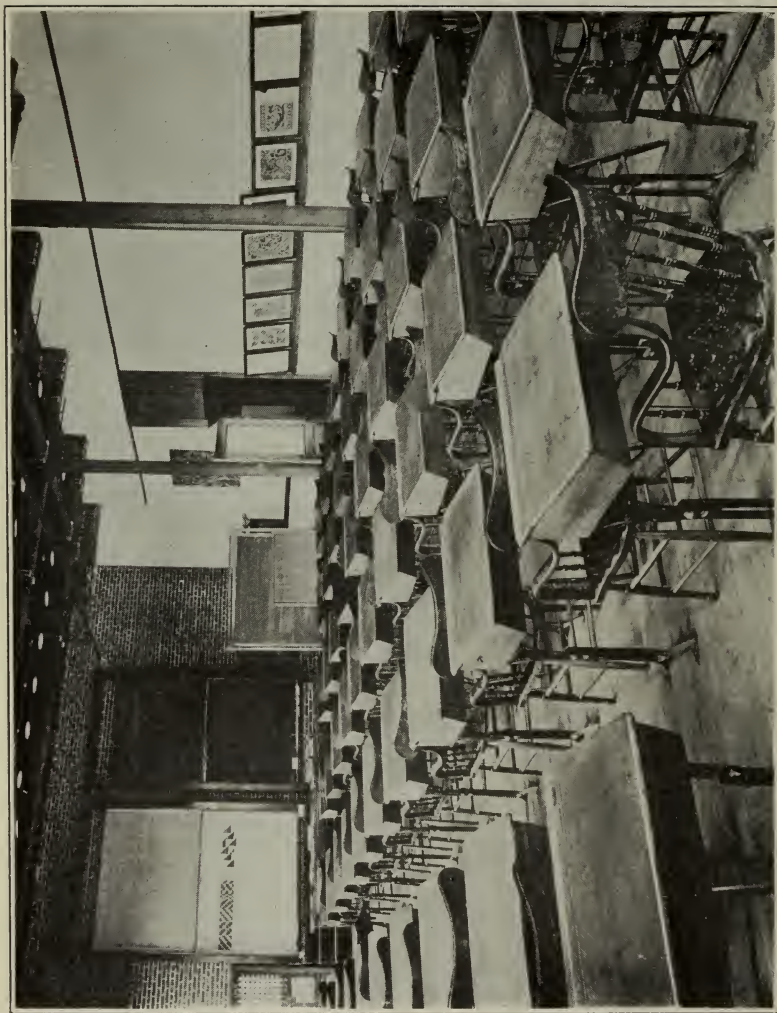
Backwashing

One Double Bowl, Five Cylinder Backwasher, with Gill Box, Taylor-Wadworth & Co., Leeds, Eng., equipped with blueing motion, oiling motion, and Layland Patent pressure motion.

Gilling

One Doubling Balling Head Gill Box (with double screws), Saco-Lowell Shops, Lowell, Mass.

One Weigh Gill Box and Creel, Saco-Lowell Shops, Lowell, Mass.



DESIGN LECTURE ROOM

Combing

- One Baller, (punch), Crompton & Knowles, Worcester, Mass.
One Noble Worsted Comb, Crompton & Knowles, Worcester, Mass.

Gilling

- One Finishing Can Gill Box, Hall & Stell, Keighley, England.
One Finishing Balling Head Gill Box, Hall & Stell, Keighley, England.

Bradford System of Drawing, Spinning and Twisting

The following Drawing, Spinning and Twisting Machinery, from Prince Smith & Son, Keighly, England.

- | | |
|-----------------------------------|-------------------------------------|
| One Revolving Creel for 12 Balls. | One Double Head Can Gill Box. |
| One 2 Spindle Drawing Box. | One 2 Spindle Gill Box. |
| One 2 Spindle Weigh Box. | One 12 Spindle Flyer Spinner. |
| One 4 Spindle First Finisher. | Ont 12 Spindle Ring Spinner. |
| One 12 Spindle Dandy Reducer. | One 12 Spindle 2 Fold Cap Twister. |
| One 12 Spindle Cap Spinner. | One 12 Spindle 6 Fold Ring Twister. |

The following Drawing, Spinning and Twisting Machinery from the Saco-Lowell Shops, Lowell, Mass.

- One 2 Spindle Drawing Box. One 8 Spindle Cone Rover.
One 6 Spindle Second Finisher. One 48 Spindle Cap Spinner, 4 ft. end.
One 24 Spindle Dandy Rover. One 48 Spindle Cap Spinner, 5 ft. end.
One 6 Spindle Cone Reducer. One 48 Spindle Boyd Ring Twister.
One Six Gang Universal Winder, equipped for cones or straight tubes,
Universal Winding Co., Boston, Mass.
One Tape Band Sewing Machine, The Singer Mfg. Co., New York.

French System of Drawing and Spinning

The machinery made by the "Societe Alsacienne de Constructions Mechaniques" at Mulhouse, France, consists of the following:

- | | |
|---|--|
| Peigneuse-Laine modèle P. L. B. | Model P. L. B. Comb with creel for 24 doublings. |
| Intersecting de 2 têtes. Pass. I and II après Peigneuses. | Intersecting Gill Box (2 heads) |
| Gill Box (2 têtes) | Gill Box (2 heads) |
| Étirage à Frottoirs (2 têtes) | 1st Drawing (2 heads) |
| tirage à Frottoirs (2 têtes) | 2nd Drawing (2 heads) |
| Étirage à Frottoirs (2 têtes) | 3rd Drawing (2 heads) |
| Étirage Réunion (4 Peignes) | Reducer (4 Porcupines) |
| Bobinier de Chûte (8 Peignes) | Slubber (8 Porcupines) |
| Bobinier (8 Peignes) | 1st Intermediate (8 Porcupines) |
| Bobinier (8 Peignes) | 2nd Intermediate (8 Porcupines) |
| Bobinier (8 Peignes) | Rover (8 Porcupines) |
| Finisseur (16 Peignes) | Finisher (16 Porcupines) |
| Self-acting à Filer (150 Broches) | Self-acting Worsted Mule (150 Spindles) |



DECORATIVE ART

The apparatus in this department for obtaining and preserving the requisite condition of humidity consists of:

Four Humidifiers of the American Moistening Co., Boston, Mass.

Nine Turbo Humidifier Heads from The G. M. Parks Co., Fitchburg, Mass. The compressed air for these heads is supplied by an Ingersoll-Rand 8 x 8 steam driven air compressor located in power house.

Yarn Weighing and Testing

From Lowell Scale Company:

One Large Platform Scale.

From Howe Scale Company

One Dram Scale.

One Gram Scale.

One Ounce Scale.

One Pound and Ounce Scale.

Two Yarn Reels.

One Roving Reel.

Three Grain Scales.

One Run Beam.

One Hand Yarn Strength Tester.

Two Twist Counters.

Two Barbour Knotters.

Complete Set of Roving Cans from the Laminar Fibre Co., North Cambridge, Mass.

TEXTILE TESTING LABORATORY

Through the generosity of a friend of the School a laboratory has been provided with the most approved apparatus for testing the physical properties of all fibres, yarns and fabrics; the equipment includes:

One Bausch and Lomb D. D. Microscope.

Two inch, 1 inch, and 1-2 inch regular eyepieces.

Three-fourths inch (photographic), 2-3 inch, 1-6 inch, 1-12 inch (oil immersion) objectives.

One Eye Piece Micrometer.

One Filar Micrometer, (1 inch equivalent eyepiece) for refined diameter determinations.

One Standard Glass Stage, divided to 1-10 and 1-100 m. m. with corrections as tested against the International m. m.

Complete outfit for mounting shades.

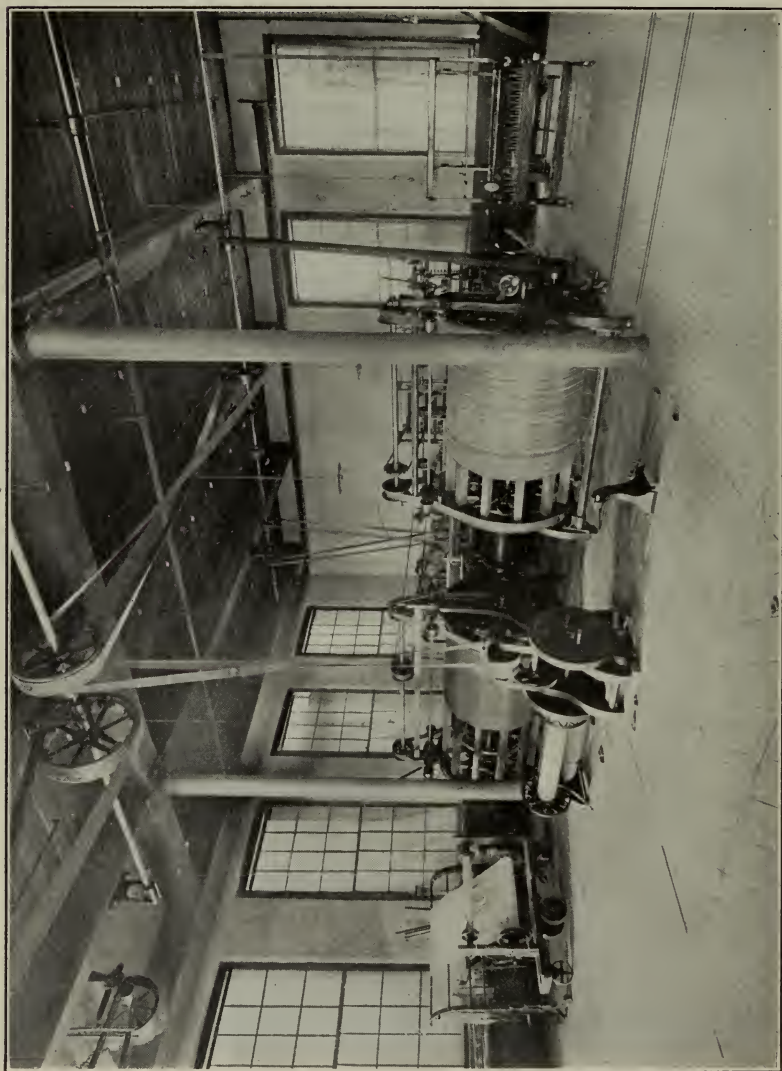
Complete outfit for photo micrography.

Camera Lucida.

Microtome Sectioning Outfit.

One Small Skein Testing Machine.

One Conditioning Oven for moisture determination.



WOOLEN AND WORSTED WARE PREPARATION

One Yarn Testing Machine, adjusted to test strength, twist, take up, elasticity and stretch.

One Hydraulic Cloth Strength Testing Machine for 4 inch samples.

One Cloth Strength Testing Machine for 1 inch samples.

One Brown & Sharpe Metre Reel.

The proper conditions of humidity in this laboratory are obtained and maintained by one Air Turbo Humidifier Head, made and installed by The G. M. Parks Mfg. Co., Fitchburg, Mass., and also by one Humidifier Head made by Schutte & Koerting Co., Philadelphia, Pa.

DESIGN AND POWER WEAVING DEPARTMENT

Cotton Warp Preparation

One Spooler, Saco-Lowell Shops, Lowell, Mass.

One Warper, Saco-Lowell Shops, Lowell, Mass.

One Slasher, Saco-Lowell Shops, Lowell, Mass.

One Beamer, T. C. Entwistle Co., Lowell, Mass.

One Winder, Altemus & Co., Philadelphia, Pa.

One 400 End Improved Draper Warper, Draper Co., Hopedale, Mass.
Drawing-in Frames, etc.

One Pat. Slasher Press Roll, J. Battles & Co., Lawrence, Mass. ..

One Pat. Expansion Comb for Warper, T. C. Entwistle Co., Lowell, Mass.

One Quiller, Johnson & Bassett, Worcester, Mass.

Set of six in. spools for Warper, Macrodi Fibre Co., Woonsocket, R. I.

One Universal Winder for Cop and Bobbin winding, Universal Winder Co., Boston, Mass.

Woolen and Worsted Warp Preparation

Two 40 End Jack Spoolers.

Two Spool Racks for 12 spools each.

One Pattern Dry Frame Dresser.

One Pipe and Cylinder Dresser.

One 60 inch Reel.

One 82 inch Reel.

One Double Head Beamer.

All made by the Davis & Furber Machine Co., North Andover, Mass.

Braiding Machinery

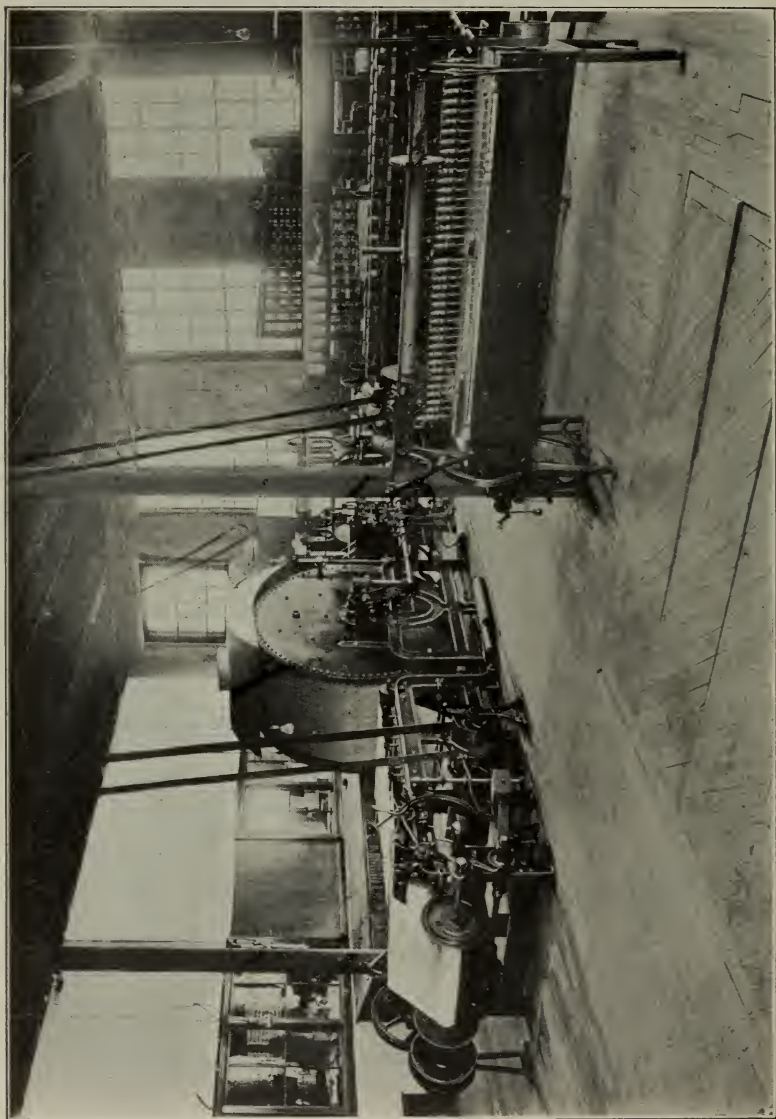
One 24 Line Hercules Braider.

One 12 Line Braider.

One Tubular Braider.

One Sautach Braider.

All made by the New England Butt Co., Providence, R. I.



COTTON WARP PREPARATION

Silk Preparing Machinery

- One Winder, Atwood Machine Co., Stonington, Conn.
- One Ribbon Quiller, Atwood Machine Co., Stonington, Conn.
- One Warper and Beamer, Swiss Style, Atwood Machine Co., Stonington, Conn.
- One Double Frame, Atwood Machine Co., Stonington, Conn.

Plain Looms

- One Plain Northrop Loom, Draper Co., Hopedale, Mass.
- One Plain Print Cloth Loom, Whitin Machine Works, Whitinsville, Mass. To this is attached a Kip-Armstrong Warp Electric Stop Motion.
- One Plain Print Cloth Loom, Mason Machine Works, Taunton, Mass.
- One Kilburn & Lincoln Plain Loom.
- Eight Saco-Lowell Shops Plain Looms.
- One English Loom, Hattersley.
- One Improved Northrop Loom, fine sateen, Draper Company, Hopedale, Mass.
- One Eight Harness Corduroy Loom, Draper Company, Hopedale, Mass.
- One Side Cam Twill Loom, Whitin Machine Works, Whitinsville, Mass.
- One Five Harness Sateen Loom, Saco-Lowell Shops, Lowell, Mass.
- One Harriman Automatic Shuttle Changing Loom.
- One Lewiston Machine Co. Loom, 4 harness, side cam.
- One Crompton Jean Loom.

Fancy Looms

- One Northrop Loom with dobby, Draper Co., Hopedale, Mass.
- One Lewiston Machine Company Bag Loom.
- One Knowles Gingham Loom, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Gingham Loom, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Towel Loom, 2 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Lappet Loom, with 16 harness dobby, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 20 harness dobby, 4 x 1 boxes, for fancy leno work, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 25 harness dobby, Crompton-Knowles Loom Works.
- One Crompton Fancy Cotton Loom, single cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
- One Knowles Gem Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.

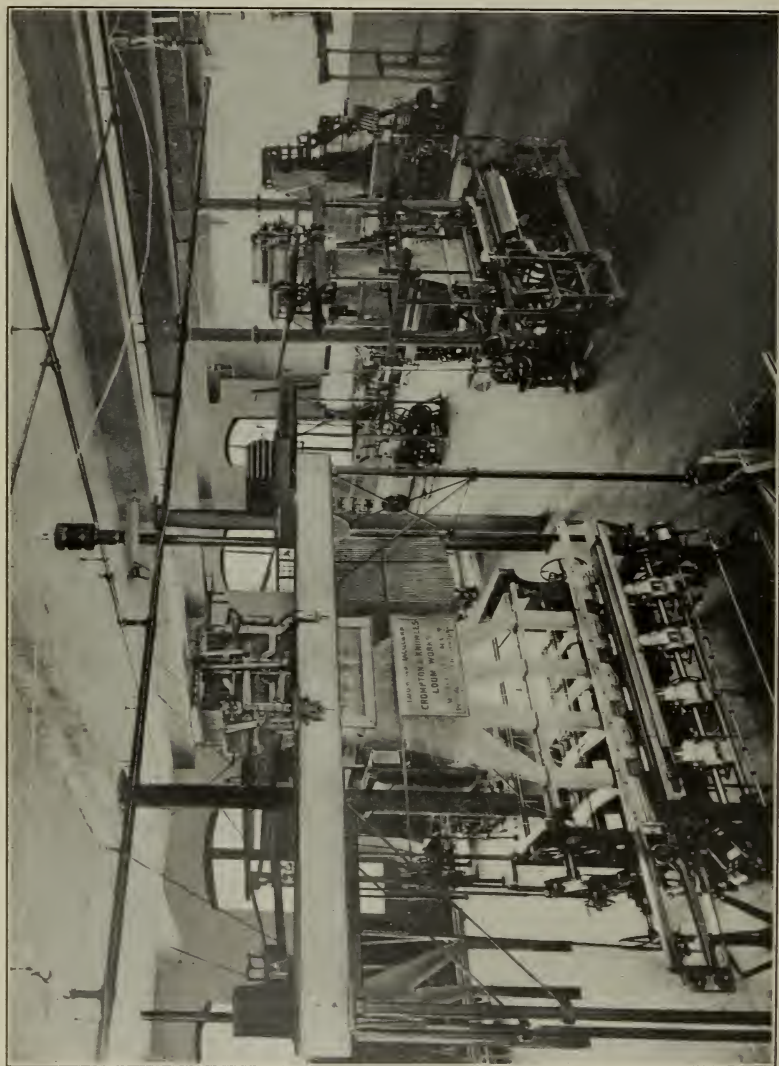


WEAVE ROOM

One Crompton Worsted Loom, 24 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Crompton Fancy Loom, 6 x 1 double cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
 One Twenty Harness Dobby Loom, Whitin Machine Works, Whitinsville, Mass.
 One Crompton & Knowles Heavy Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Knowles Blanket Loom, 25 harness dobby, 4 x 1 boxes, Crompton-Knowles Loom Works.
 One Knowles Worsted Loom, 32 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 Three Knowles Heavy Woolen Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 Three Crompton & Knowles Intermediate Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Model Dobby Attachment.

Jacquard Looms

One Knowles Fancy Loom, single lift Jacquard, Crompton-Knowles Loom Works.
 One Knowles Fancy Loom, double lift Jacquard, Crompton-Knowles Loom Works.
 One Knowles Fancy Loom, Jacquard tied up for leno, Crompton-Knowles Loom Works.
 One Knowles Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Knowles Loom, 4 x 4 boxes, 54 inch, with 600 hook double lift double cylinder McMurdo Jacquard Head. Tied up for damask napkin designs.
 One Crompton Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Stafford Silk Loom, 1200 hook Halton Jacquard.
 One Crompton & Knowles 72 in. Tapestry Loom with 2600 hook Halton Jacquard Head.
 One 400 hook single lift, Schaum & Uhlinger Jacquard mounted for 4 bank narrow fabric loom.
 One 840 hook double lift, single cylinder Jacquard on Crompton-Knowles 4 bank ribbon loom.
 One 800 hook, double lift Knowles Gem Silk Brocade Jacquard Machine, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Felix Tonnar German Plush Loom with 400 hook Crompton-Knowles Jacquard Head.



WEAVE ROOM, JACQUARD SECTION

Card Cutting Machines

One Jacquard Fine Index Card Cutting Machine, John Royle & Sons,
Paterson, N. J.

One Jacquard French Index Card Cutting Machine, John Royle &
Sons, Paterson, N. J.

Hand Loom Weaving

Twelve Hand Looms, 3 x 3 boxes, 20 harness dobby.

Eight Hand Looms, 4 x 4 boxes, 24 harness dobby.

Eight Hand Looms, 3 x 3 boxes, 32 harness dobby.

Six Hand Looms, 4 x 4 boxes, 30 harness dobby.

Two Hand Looms, 4 x 4 boxes, 32 harness dobby.

Two Hand Looms, 4 x 4 boxes, 200 hook Jacquard.

Two Hand Looms, 3 x 3 boxes, 200 hook Jacquard.

Two Hand Looms, 3 x 3 boxes, 600 hook Jacquard.

One Hand Loom, 48 harness.

Two Hand Looms with treadles.

Pattern Warping Stands.

Beaming, drawing-in stands, etc.

CHEMISTRY AND DYEING DEPARTMENT

Chemical Laboratories

The General Chemistry and Qualitative Analysis Laboratory includes:

One hundred and twenty laboratory desks, each containing a full set
of apparatus for the first year's work in Chemistry; also gas and
water fittings, reagents and sinks.

Four Large Double Hoods.

Two Steam Baths.

Two Parson's Automatic Gas Generators.

Quantitative Laboratory

One Water Distilling Apparatus.

One Steam Drying Closet and Several Drying Ovens.

One Large Steam Bath.

One Electrolytic Table.

Five Hoods.

Fifty laboratory desks, each fully provided with apparatus.

Balance Room

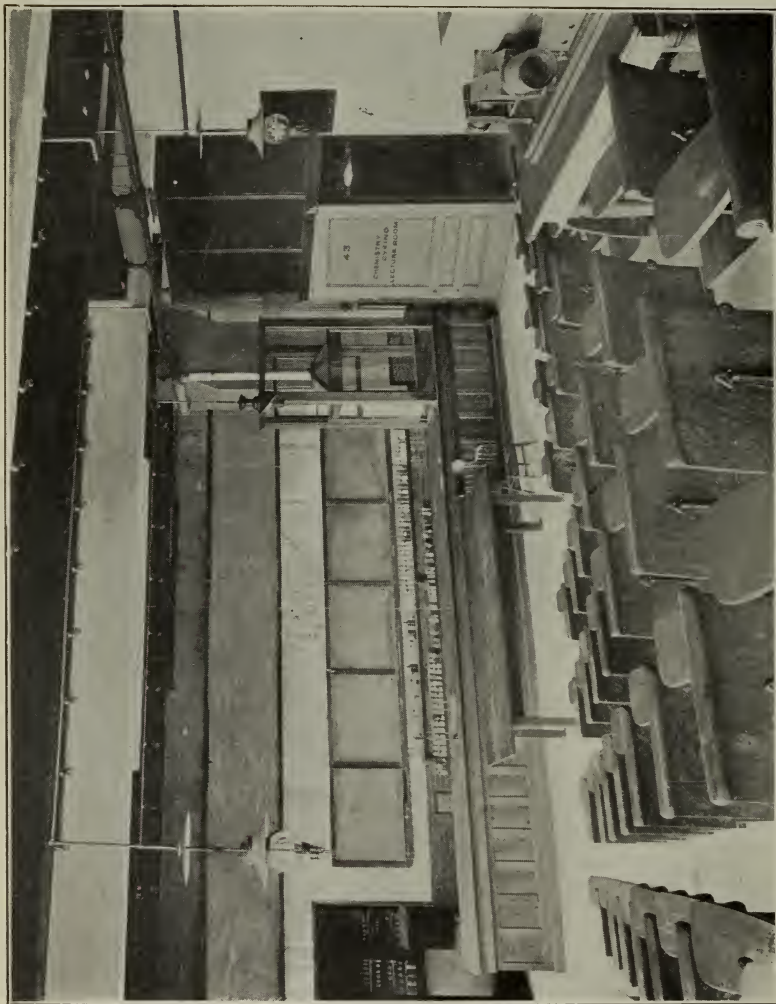
One Large Christian Becker Analytical Balance.

Seven Small Christian Becker Analytical Balances.

One Standing Analytical Balance.

One Eimer & Amend Analytical Balance.

One H. L. Becker's Son & Co. Analytical Balance.



CHEMISTRY LECTURE ROOM

Combustion Room

- One Combustion Furnace, 25 burners.
- One Lothar Meyer's Furnace for tubes.
- One Kerosene Burner Muffle Furnace.

Microscopic and Colorimetric Laboratory

- Two Benches for microscopical work.
- Three Bausch & Lomb Compound Microscopes.
- One Nachet et Fils Compound Microscope.
- One Tintometer.
- One Ives Colorimeter.
- One Polariscope made by Franz Schmidt & Haensch, Berlin, Germany.
- One Spectroscope made by John Browning, London, England.
- Desks and shelves for the apparatus and reagents necessary for this branch of the work.
- Adjoining this Laboratory is a dark room for Spectrum Analysis, Photometric Work, etc.

Assistant Instructor's Laboratory

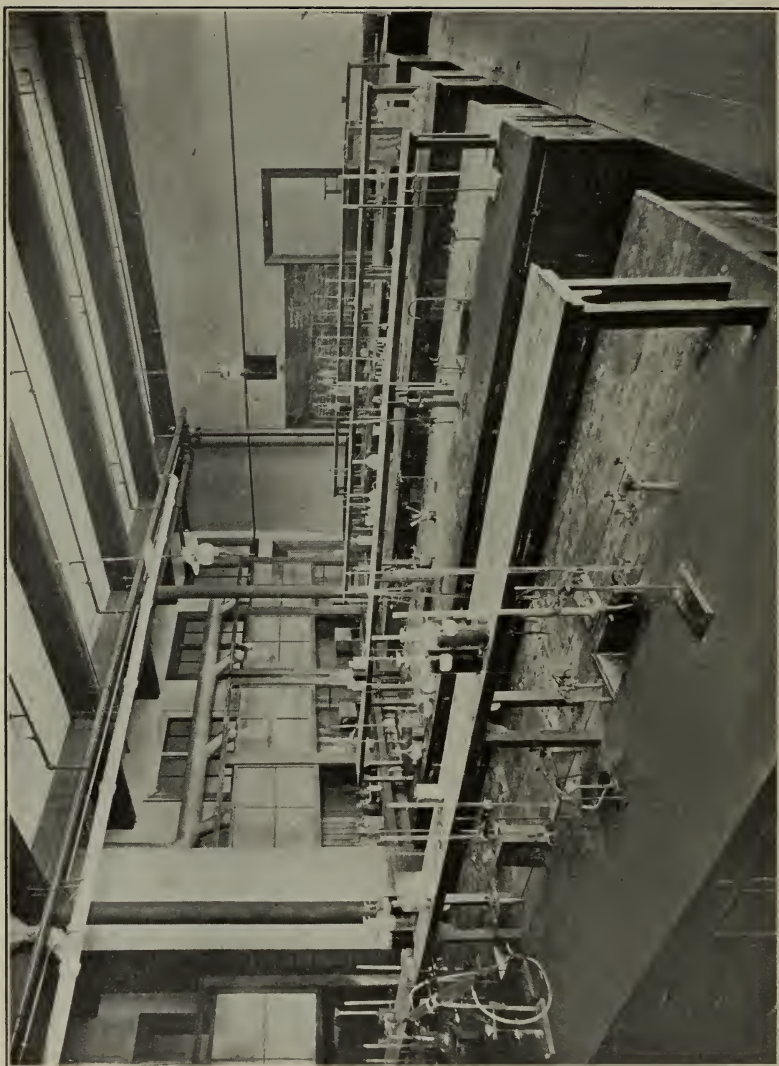
- One Large Case of Chemicals.
- One Double Hood.
- One Copper Water Bath.
- One Soapstone Sink with a drain board.
- Benches, desks and complete fittings for water, gas and suction.

Private Laboratory

- One Groemner Balance.
- One Large B. & L. Microscope.
- One Case for Chemicals and Apparatus.
- Three Laboratory Benches, with necessary fittings.
- One Large Hood.
- One Steam Bath.
- One Experimental Dye Apparatus.
- One Porcelain Sink and Drain Board.

Chemical Lecture Room

- Is provided with a lecture table fully equipped with gas, water, sinks, a hood and sufficient apparatus for lecture experiments.
- An electric arc reflectroscope provided with suitable screen, which makes it possible to illustrate a lecture either from slides or by cuts, photographs or objects.
- Seats are provided for eighty students, and are arranged on a raised floor so that every student has a full view of the lecture table.
- This room contains various collections of dyestuffs and chemicals for exhibition and for lecture demonstration.



QUANTITATIVE LABORATORY

Experimental Dyeing Laboratory

The dyeing laboratory is equipped with individual benches, small dyeing apparatus, reels, balances, apparatus for dye testing, such as frames for exposing dyed material to light, and a complete collection of dyestuff samples and sample cards.

One Small Hydro-Extractor, from W. H. Tolhurst & Son, Troy, N. Y.

Twenty-four Steam Jacketed Experimental Dyeing Machines.

Thirty Steam Coil Experimental Dyeing Machines.

One Drying Chamber.

One Ageing Chamber.

Experimental Printing Laboratory

One Calico Printing Machine, made by Mather & Platt, Manchester, England.

One Iron Jacketed Steaming Chamber from A. Edmeston & Son, Patricroft, England.

One set of Steam Jacketed Copper Kettles.

Fuel and Oil Analysis Laboratory

Mahler Bomb Calorimeter, with complete outfit.

Emerson Bomb Calorimeter, with complete outfit.

Parr Calorimeter.

Abbe Refractometer.

Torsion Viscosimeter.

Tagliabue Viscosimeter.

Tagliabue Cold Test Apparatus.

Pensky Martin Oil Tester.

N. Y. State Oil Tester.

Sartorius Specific Gravity Balance.

Two Becker Analytical Balances.

Gas Muffle Furnace.

Kny Scherer Oil Tester.

Graefe Gas Calorimeter.

Orsat Gas Analysis Apparatus.

Laboratory Tables, Lockers and Hoods.

Industrial Chemistry Laboratory

One Filter Press, Type E, T. Shriver and Co.

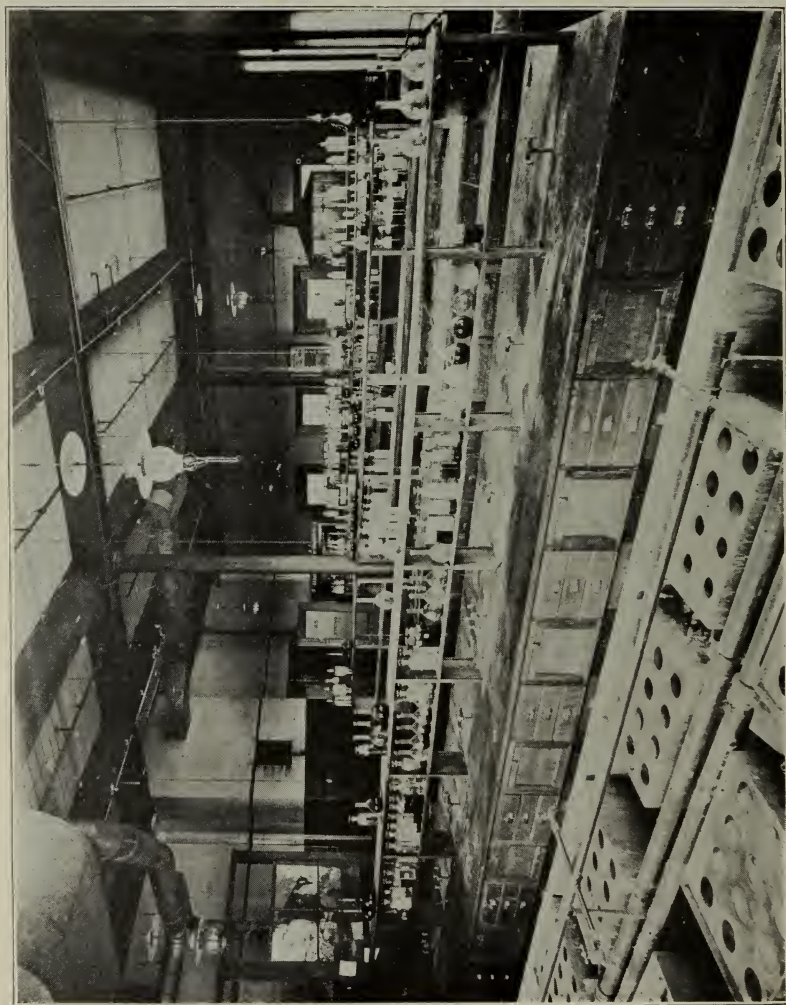
One Single Acting Triplex Plunger Pump, Gould's Mfg. Co.

One Vacuum Drying Apparatus, Norman Hubbard's Sons.

One Surface Condenser, Norman Hubbard's Sons.

One Packard Vacuum Pump, Norman Hubbard's Sons.

One Vacuum Evaporator, Swenson System, American Foundry and Machine Co.



EXPERIMENTAL DYEING LABORATORY

One Centrifugal, C. H. Chavant and Co.
 One Double Jar Mill, F. I. Stokes and Co.
 One Sturtevant Ore Crusher.
 One Sturtevant Pulverizer.
 Ten Copper Steam Baths, D. H. Wilson and Co.
 One 36 in. Ventilating Fan, Mass. Fan Co.
 One Autoclave.
 Lockers and Tables.

Commercial Dyeing Laboratory

One Kier, Atlantic Works, East Boston, Mass.
 One small Kier, fitted with E. D. Jefferson's circulating device.
 One Electrolyzer for manufacturing bleaching solutions, The National Laundry Machine Co., Dayton, Ohio.
 One Single Shear, Curtis & Marble. Donated by Mass. Mohair Plush Mass.
 One Mercerizing Machine.
 One Raw Stock Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
 One Yarn Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
 One jig Dyeing Machine, The Textile-Finishing Machinery Co., Providence, R. I.
 One set of Drying Cans, The Textile-Finishing Machinery Co., Providence, R. I.
 One Chain Dyeing Machine, T. C. Entwistle Co., Lowell, Mass.
 One Raw Stock Drying Table, Philadelphia Textile Machinery Co., Philadelphia, Pa.
 One Padding Machine, Arlington Machine Works, Arlington, Mass.
 One Hydro-Extractor, W. H. Tollhurst & Son, Troy, N. Y.
 One Experimental Dyeing Machine, The Psarski Dyeing Machine Company, Cleveland, Ohio.
 Seven Dye Tubs.
 One Power Yarn Reel.
 One Reeves' Variable Speed Device.
 Two Trucks.

FINISHING DEPARTMENT

Woolen and Worsted

One 2 string Washer, Rodney Hunt Co., Orange, Mass.
 One Fulling Mill, Rodney Hunt Co., Orange, Mass.
 One Sample Fulling Mill, James Hunter & Co., North Adams, Mass.
 One Up and Down Dry Gig, Curtis & Marble, Worcester, Mass.
 One Rolling and Stretching Machine, Curtis & Marble, Worcester, Mass.

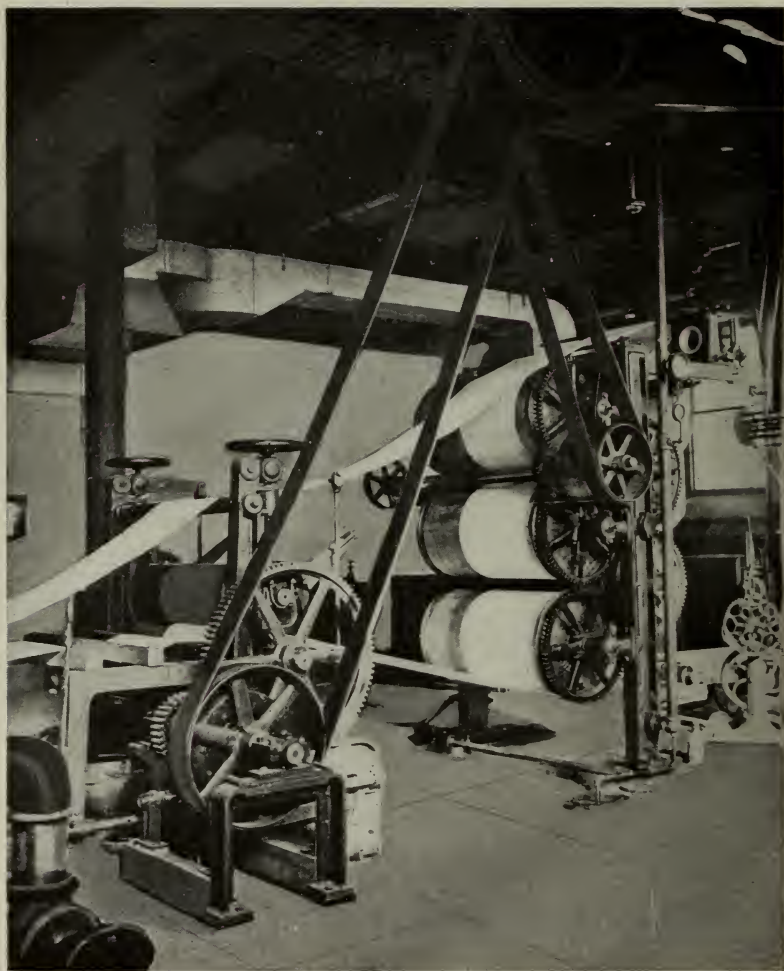


INDUSTRIAL CHEMISTRY LABORATORY

- One Up and Down Wet Gig, Curtis & Marble, Worcester, Mass.
- One Steam Finishing Machine, Curtis & Marble, Worcester, Mass.
- One 60 in. 3 burner Singeing Machine, adapted for Cotton, Silk or Worsted Goods, Curtis & Marble, Worcester, Mass.
- One Two Cylinder Double Acting Brushing Machine, Curtis & Marble, Worcester, Mass.
- One 60 in. 4 Cylinder Sanding and Polishing Machine, Curtis & Marble, Worcester, Mass.
- One Kicker Mill, James Hunter & Co., North Adams, Mass.
- One 6-4 Double Shear, Parks & Woolson, Springfield, Vt.
- One Single Shear, Curtis & Marble. Donated by Mass. Mohair Plush Co., Lowell, Mass.
- One Dewing Machine, G. W. Voelker & Co., Woonsocket, R. I.
- One 6-4 Voelker Rotary Press, G. W. Voelker & Co., Woonsocket, R. I.
- One Tentering and Drying Machine, John Heathcote, Providence, R. I.
- One Single Crabbing Machine, H. W. Butterworth & Son, Philadelphia, Pa.
- One 72 in. Woolen Napper, Davis & Furber, North Andover, Mass.
- One 32 in. Basket Hydro-Extreor, W H.. Tolhurst, Troy, N. Y.
- One A. W. C. Measuring and Weighing Machine, Parks & Woolson, Springfield, Vt.
- One Lintz & Eckhardt Cloth Numbering Machine, Improved by Durbrow & Hearne Mfg. Co., New York.
- One Steam Press for Underwear, United States Hoffman Co., Syracuse, N. Y.
- One Sewing Machine, Birch Brothers, Somerville, Mass.
- Soap tanks, perch, burling and measuring tables.

Cotton Finishing Machinery

- One 40 in. Inspecting and Brushing Machine, Curtis & Marble, Worcester, Mass.
- One 44 in. No. 25 Railway Sewing and Rolling Machine, Curtis & Marble, Worcester, Mass.
- One 44 in. Cotton Shearing Machine, Type No. 34, Curtis & Marble, Worcester, Mass.
- One 44 in. No. 3 Steam Calender Rolling Machine, Curtis & Marble, Worcester, Mass.
- One 40 in. Cloth Folder, Curtis & Marble, Worcester, Mass.
- One 40 in. Winder and Measurer, Curtis & Marble, Worcester, Mass.
- One set 44 in. Shear Blades for grinding purposes, Curtis & Marble, Worcester, Mass.
- One 48 in. No. 4 Opening, Sewing and Re-rolling Machine, Dinsmore Manufacturing Co., Salem, Mass.



VIEW IN COMMERCIAL DYEING LABORATORY

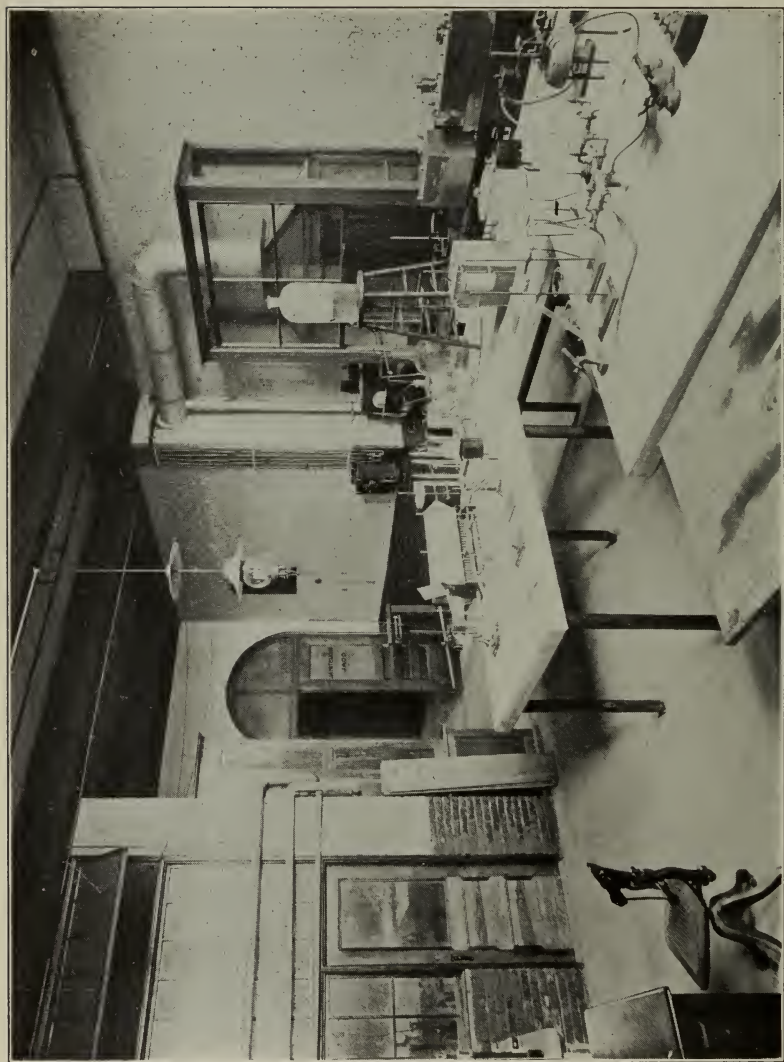
- One 40 in. 3 Roll Water Mangle, with husk and brass rolls and usual attachments, The Textile-Finishing Machinery Co., Providence,
- One 48 in. Mycock Scutcher, for the Water Mangle, Thos. Leyland & Co., 60 India St., Boston, Mass.
- One 40 in. Mycock Cloth Expander, for the Water Mangle, Thos. Leyland & Co., 60 India St., Boston, Mass.
- One 40 in. 2 Roll Starch Mangle, The Textile-Finishing Machinery Co., Providence, R. I.
- One 40 in. Upright Drying Machine with 10 copper cylinders, The Textile-Finishing Machinery Co., Providence, R. I.
- One 16 x 42 in. Bronze Covered Stretcher, for the Dyeing Cans, C. A. Luther & Co., Providence, R. I.
- One 40 in. double Bristle Stretcher, for Dyeing Cans, American Finishing Machinery Co., 141 Milk St., Boston, Mass.
- One 40 in. Sprinkler, The Textile-Finishing Machinery Co., Providence, R. I.
- One 40 in. 5 Roll Universal Calender, with chasing attachment, The Textile-Finishing Machinery Co., Providence, R. I.
- One 40 in. Mycock Cloth Expander, for the calender, Thos. Leyland & Co., 60 India St., Boston, Mass.
- One 40 in. Tommy Dodd Starch Mangle, H. W. Butterworth & Sons Co., Philadelphia, Pa.
- One Direct Driven 44 in. - 50 ft. - 0 in. Vibratory Tenting Machine, H. W. Butterworth & Sons Co., Philadelphia, Pa.

ENGINEERING DEPARTMENT

ENGINEERING LABORATORY

The engineering laboratory contains the following equipment:

- 50 H. P. Allis-Chalmers Corliss Steam Engine (Reliance type) for experimental purposes arranged to operate condensing or non-condensing and direct connected to an Alden absorption dynamometer.
- Wheeler Surface Condenser (200 sq. ft. surface) with 5 in. x 6 in. x 6 in. x 7 in. combined air and circulating pump.
- 25 K. W. Kerr Steam Turbine (7 stage) direct connected to 25 K. W. Richmond Electric Co. alternating current generator and arranged for both condensing and non-condensing conditions. The piping is also arranged that this turbine may be run as a low pressure turbine in conjunction with the Allis Chalmers engine. The generator is especially designed for experimental work with connections and windings for all the commercial phases.
- 5000 gallon Pressure Tank for heads up to 300 ft. and connections for experimental work.
- Two 2500 gallon Concrete Storage Tanks.
- Complete set of Weighing and Suction Tanks on Fairbanks Standard scales.



FUEL AND OIL LABORATORY

Deane Triplex Power Pump 4 in. x 6 in.
 Clayton Air Compressor (belted type) 6 in. x 6 in.
 Centrifugal Pump, 2 inch (belted type), Lawrence Machine Company,
 Lawrence, Mass.
 Two Sturtevant Fan Blowers for experimental work.
 Metropolitan Injector.
 Differential Transmission Dynamometer.
 Variable Speed Transmission.
 Accessory apparatus such as steam and gas engine indicators, plan-
 imeters, thermometers, etc. Apparatus for gas analysis is also
 available and the chemical department is fully equipped for cal-
 orific determinations of fuels.
 All steam supplied to the laboratory passes through a 4 inch horizontal
 Cochran steam separator to insure dry steam for experimental
 work.
 Buff & Buff Engineers Transit.
 Philadelphia Level Rod.
 Apparatus for testing friction and slip of belts and pulleys.
 Standard Westinghouse A. C. Generator, Switchboard Panel with
 special instruments and connections for 25 K. W. turbo-generator
 in 2-phase, 3-phase or single phase.
 Westinghouse Portable Polyphase A. C. Wattmeter with series trans-
 formers.
 Two General Electric A. C. Ammeters.
 One General Electric A. C. Voltmeter.
 General Electric 3 H. P. Induction Motor.
 Allis-Chalmers 10 H. P. Direct Current Motor.
 One 4 H. P. G. E. Electric Dynamometer which may be used as a
 double current generator or rotary transformer receiving direct
 current at 220 volts and delivering three phase alternating current
 which by a step-up transformer will give 220 volts at 60 cycles.
 One 250 volt Weston Portable Voltmeter.
 One 250 volt Weston Portable Voltmeter with calibrating coil.
 One 150 ampere Weston Portable Ammeter.
 One Weston Portable Millivoltmeter with 200 milli-volt and 20 milli-
 volt scales.
 One 2 ampere and one 20 ampere Shunt for use with above instru-
 ment as an ammeter.
 One D'Arsonval Reflecting Galvanometer.
 One Simple Galvanometer.
 One Wheatstone Bridge.
 Two Hand Feed Arc Lamps for stereopticons.
 Resistance boxes of various sizes and other apparatus necessary for
 commercial testing of lamps, motors, etc.
 An Exhibition Board containing samples of the Chloride and Exide
 Storage Battery Plates donated by the Electric Storage Battery
 Co. of Philadelphia.
 Miscellaneous apparatus for experiments in Mechanics, Heat, Light,
 Sound and Electricity.



MACHINE SHOP

Machine Shop

The equipment of the machine shop is as follows:

- Four Standard Engine Lathes, 13 inch swing, 6 ft. bed, from Flather & Co., Nashua, N. H.
- Three Standard Engine Lathes, 14 inch swing, 6 ft. bed, from Flather & Co., Nashua, N. H.
- One Standard Engine Lathe, 15 inch swing, 6 ft. bed, from F. E. Reed Co., Worcester, Mass.
- One Engine Lathe, 18 inch swing, 10 ft. bed, from Flather & Co., Nashua, N. H.
- One Engine Lathe, 18 inch swing, 6 ft. bed, from Champion Tool Works, Cincinnati, Ohio.
- One Standard Engine Lathe, 15 inch swing, 6 ft. bed, from S. H. Putnam Sons, Fitchburg, Mass.
- Five Speed Lathes, 17 inch swing, 5 ft. bed, from J. G. Blount, Everett, Mass.
- One No. 1 Universal Milling Machine, with all three feeds automatic, from Kempsmith Mfg. Co., Milwaukee, Wis.
- One 24 in. x 24 in. 6 ft. Planer, from the Mark Flather Planer Co., Nashua, N. H.
- One 23 inch Upright Drill with back gears and power feed, from J. E. Snyder & Son, Worcester, Mass.
- One 14 inch Single Sensitive Drill from the Stanley Mfg. Co., Lawrence, Mass.
- One No. 1 Universal Grinder from Landis Tool Co., Waynesboro, Penn.
- One 20 inch Wet Tool Grinder from J. G. Blount, Everett, Mass.
- One 12 inch, Two Wheel, Dry Grinder from J. G. Blount, Everett, Mass.
- One American Twist Drill Grinder from the Heald Machine Co., Worcester, Mass.
- One Type 1 B Portable Electric Grinder from the Cincinnati Elec. Tool Co., Cincinnati, Ohio.
- One 30 inch Grindstone and Frame from the Athol Machine Co., Athol, Mass.
- One Single Spindle Centering Machine from D. E. Whiton Machine Co., New London, Conn.
- One 15 inch Shaper from Potter & Johnson, Pawtucket, R. I.
- One Power Hack Saw from the Fairbanks Co., Boston, Mass.
- One Cold Saw from John T. Burr & Son, Brooklyn, N. Y.
- Two Blacksmith Forges, Anvils and Tools are also provided.
- One Gas Oven for hardening and tempering tools.



MECHANICAL DRAWING ROOM

These tools are fully equipped with chucks, centres, tools, etc., for a great variety of work. Benches with vises are also provided for such work as chipping, filing, etc.

A thoroughly equipped tool room contains an ample stock of the best makes of small tools such as drills, taps and dies, milling cutters, reamers, gauges, micrometers, etc.

The following wood working tools are also provided in addition to benches for pattern making:—

One Pattern Maker's Lathe, 16 in. swing, 8 ft. bed, from Fay & Scott, Dexter, Me.

One 32 in. Band Saw from the Crescent Machine Co., Leetonia, Ohio.

One Iron Single Saw Bench, from the Crescent Machine Co., Leetonia, Ohio.

One Buzz Planer from W. W. Carey, Lowell, Mass.

POWER, LIGHT, HEAT AND VENTILATING PLANT

One 300 H. P. Aultman and Taylor Horizontal Water Tube Boiler, equipped with U. S. Rocking Grates.

Two 100 H. P. Stirling Water Tube Boilers.

These boilers are connected to a Sturtevant Induced Draft Apparatus, including fan, direct connected to the Sturtevant vertical engine and equipped with two way dampers. One of the Stirling Boilers is so piped that it may be cut off from the regular plant in order to supply the Engineering Laboratory only.

One Sturtevant Smoke Filtering Apparatus.

One Locke Steam Pressure Regulator for draft engine.

One Knowles Boiler Feed Pump, 6 in. x 4 in. x 6 in.

One Warren Webster Feed Water Heater, Filter and Oil Extractor.

One 30,000 lbs. Cochrane Metering Open Feed Water Heater, provided with Lea Recorder and Oil Extractor, Harrison Safety Boiler Works, Philadelphia, Penn.

One Payne 14 in. x 14 in. Automatic High Speed Engine of 125 H. P.

One 9 1-2 in. x 11 3-4 in. Nash Gas Engine of 50 H. P. of the four cycle type, with speed regulating clutch and hit and miss governor.

One Motor Driven Air Compressor 5 1-2 in. x 6 in. with a storage tank of 20 cubic feet capacity, 100 lbs. per sq. in. pressure.

One Complete Sturtevant Double Duct System for heating Southwick Hall. This apparatus is designed to provide the proper amount of fresh warm air called for by the State law as applied to educational institutions, and includes a 9 ft. x 4 ft. fan direct connected to the Sturtevant horizontal engine, drip tank and Knowles automatic return pump, 4 1-2 in. x 2 3-4 in. x 4 in. arranged to deliver either to the feed water heater or to the boilers direct.



ATHLETIC FIELD AND SCHOOL BUILDINGS

- Complete Ventilation System for Southwick Hall and Falmouth Street Building including 6 direct connected motor driven exhaust fans.
- One Sturtevant Fan and Heater for Kitson Hall and Falmouth Street Building, direct connected to a Sturtevant inverted engine.
- One Cross Oil Filter.
- One Complete Moistening Apparatus installed by the American Moistening Co., Boston, Mass., including Knowles triplex 4 x 4 power pump, tank, and 20 moistening heads.
- One Ingersoll-Rand 8 x 8 Steam Driven Air Compressor for use with Turbo Heads, installed in French Spinning Department, by the G. M. Parks Co., Fitchburg, Mass.
- A Complete Sprinkler System for fire protection, using the Grinnell glass button heads.
- One Bullock 75 K. W. Direct Current Multipolar Compound Generator, wound for 220 volts, over compounded 20 volts from no load to full load. This is direct connected to the Payne engine.
- One Bullock 30 K. W. Generator of the same type, direct connected to the Nash gas engine.

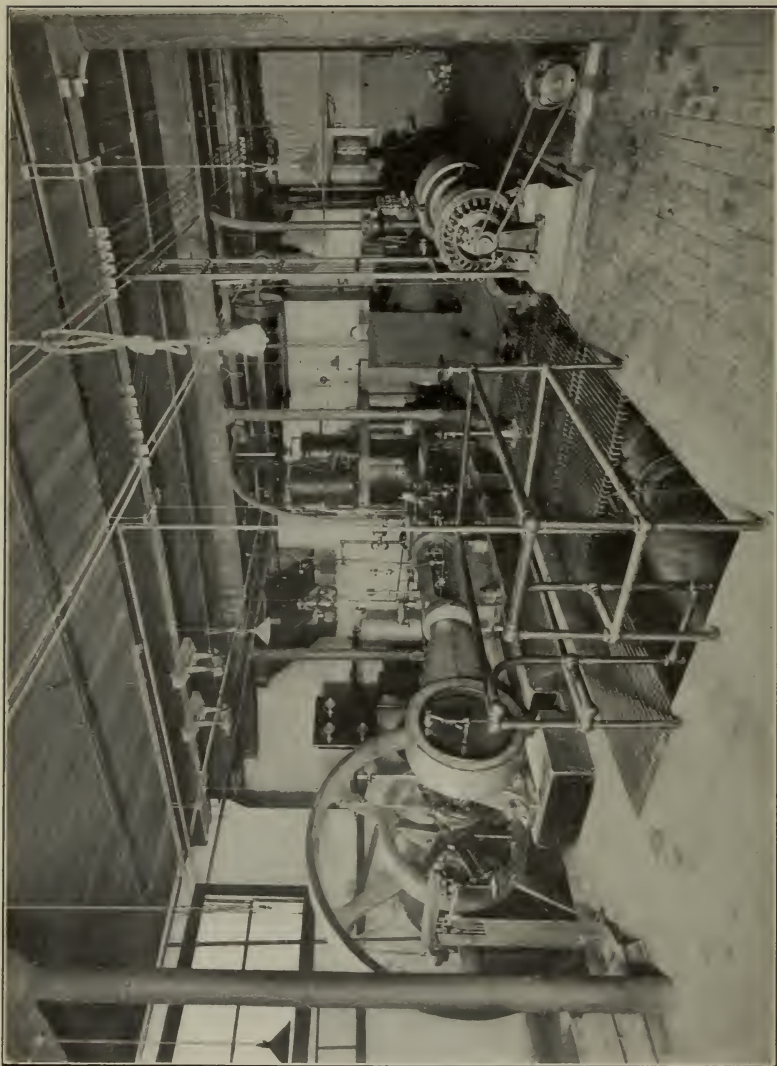
The switchboard is arranged so that either unit may be thrown in independently on the power or lighting feeders or the two machines may be run in parallel. The lighting circuits are on the two wire 220 volt system and supply the equivalent of 1030—16 candle power lamps. The power circuits are on the same system and supply approximately 234 H. P. in motors.

- One 25 H. P. Westinghouse Motor.
- One 5 H. P. Westinghouse Motor (variable speed).
- Three 24 H. P. Bullock Motors.
- One 20 H. P. General Electric Motor.
- Two 10 H. P. Allis Chalmers Motors.
- Two 7 1-2 H. P. General Electric Motors.
- Four 15 H. P. Bullock Motors.
- One 3 H. P. Motor, New England Motor Co.
- One 2 H. P. Motor, Holtzer-Cabot Electric Co.

ATHLETICS

Through the generosity of Mr. Frederick Fanning Ayer, the school has been provided with a Campus and Athletic Field of about three acres. This has been carefully graded and laid out for base ball, foot ball and track athletics. Bleachers have been provided for use at the out-of-door games.

To enclose this field the Alumni Class Fence has been partly built. It is made of forged iron sections supported between brick columns. Each section is contributed by a class, so that in the course of a few years this fence will entirely enclose the field.

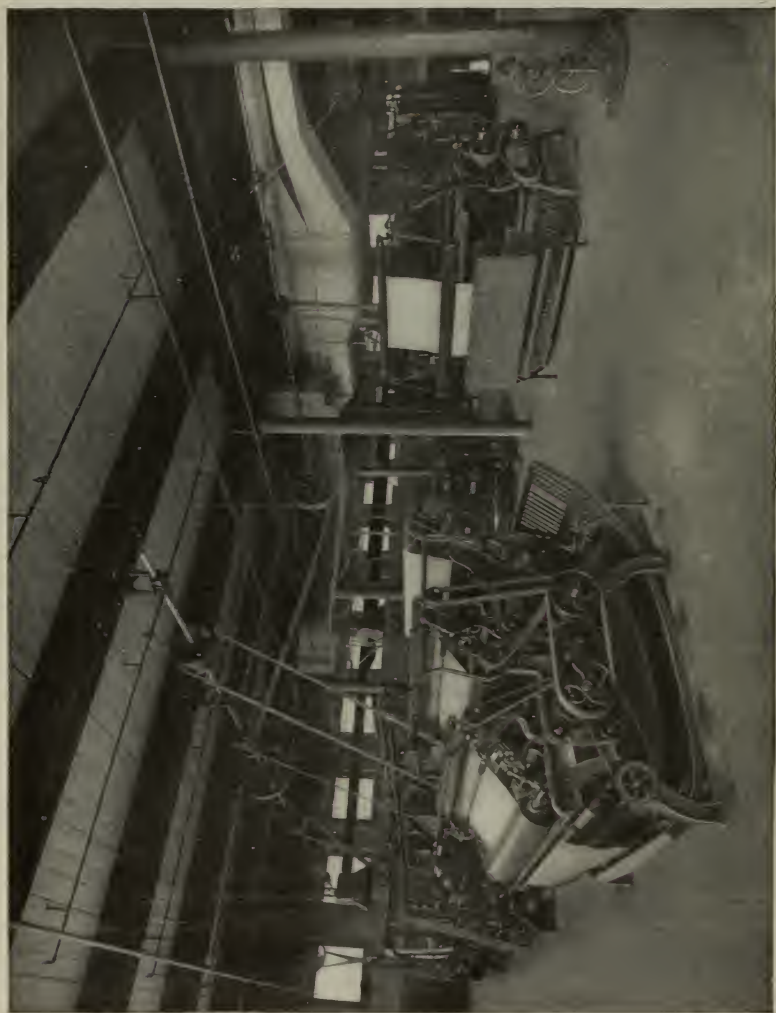


ENGINEERING LABORATORY

In the basement of Kitson Hall there has been provided a recreation room for the use of the students at such times as their attendance is not required in classes. This room is also used by those who take part in athletics, and connected to it is a smaller room provided with shower baths, lockers and toilets. Both rooms are easily accessible to the Campus by way of the outer door of Kitson Hall.

The upper hall of Southwick Hall has been equipped with gymnastic apparatus. Chest weights, wooden dumb bells, Indian clubs, a set of travelling rings, a vaulting horse, parallel bars, a punching bag and several sets of foils and single sticks have been provided.

In order to be sure that no student having any dangerous physical weakness takes part in any athletic contest, all candidates for the various athletic teams are obliged to pass a satisfactory physical examination given by the Medical Adviser of the school.



FINISHING DEPARTMENT

Day Classes

ENTRANCE REQUIREMENTS

Degree Courses

Candidates for admission to either of the degree courses must be graduates of a school approved by the New England College Entrance Certificate Board or by the Board of Regents of New York, and must present a certificate from the principal of the school, reporting upon the subjects pursued and the points obtained according to the schedule of studies given hereafter. A total of fourteen points is required.

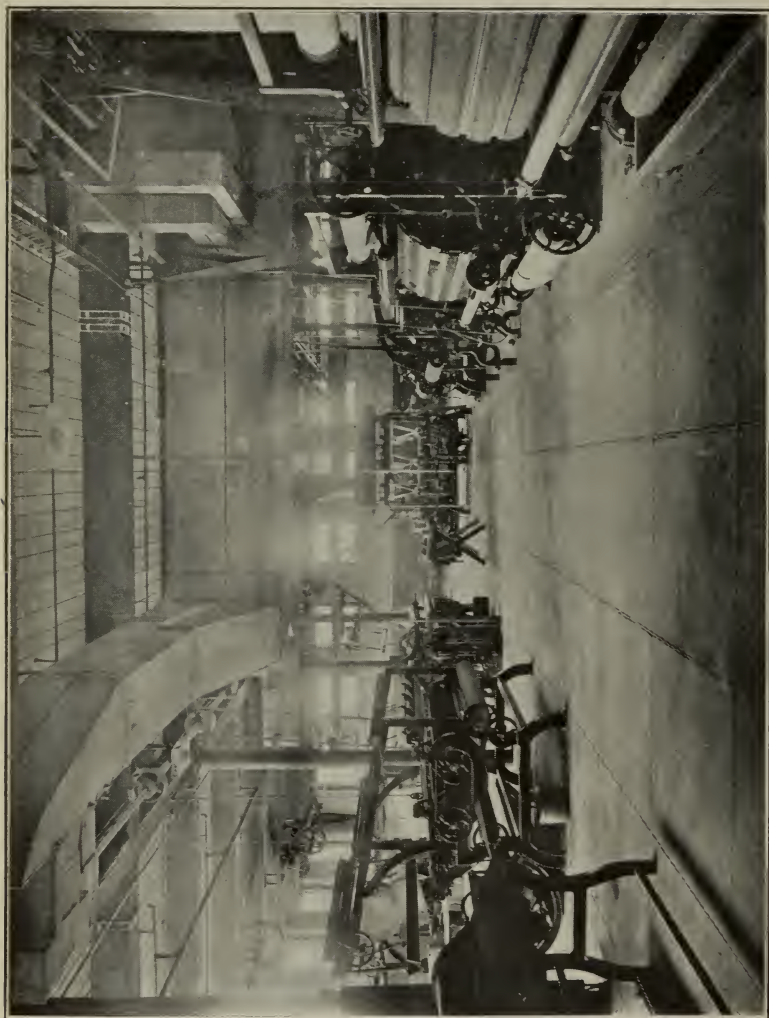
A point represents satisfactory work in a year's study in a specified subject in an approved secondary school.

Required Subjects	POINTS
Plane Geometry	1
Algebra (I Elementary. II Advanced.)	2
Elementary German A (two years) or	
Elementary French A (two years)	2
English	3
History	1
	<hr/>
	9

Elective Subjects	POINTS	
Physics	1	
Chemistry	1	
Solid Geometry	1	
Trigonometry	1	
Mechanical Drawing	1	
Mechanic Arts	1	
History	1	
Elementary French or	} Two years	1
Elementary German		
Advanced French or German (one year in addition to requirements of Elementary French A or Elementary German A		
English		1

An applicant may also be admitted on the basis of entrance examinations in which case he must pass sufficient number of the required subjects to make nine points, and present certificates showing satisfactory courses in such of the elective subjects to make five additional points.

The object of the elective requirements is to encourage greater breadth of preparation than that covered by the required branches. Certificates covering other subjects than those listed as elective will be entertained.



FINISHING DEPARTMENT

Diploma Courses

Candidates for admission to the Diploma Courses are accepted upon presentation of properly vouched certificates showing the completion of a regular four year course in a High School or Academy of reputable standing. The certificate must specify that the applicant has satisfactorily passed the necessary subjects. A total of nine points is required.

The subject matter covered should be the same as described under the required subjects for the Degree Courses with the exception of German, French and Arithmetic, the requirements for which are given specifically under Elementary German B, Elementary French B and Arithmetic (Diploma Course Requirements).

Required Subjects	POINTS
Plane Geometry	1
Algebra (I Elementary. II Advanced.)	2
Elementary German B (one year) or	
Elementary French B (one year)	1
English	3
History	1
Arithmetic	1
	<hr/> 9

ENTRANCE EXAMINATION

All students who are unable to present a certificate for either the degree or diploma courses must pass entrance examinations. The examinations for admission to the diploma and degree courses will be held as follows:

Wednesday, June 18, 1913; Tuesday, September 9, 1913; Monday, June 15, 1914:

Algebra	9 A. M. to 11 A. M.
History	11 A. M. to 1 P. M.
English	2 P. M. to 4 P. M.

Thursday, June 19, 1913; Wednesday, September 10, 1913; Tuesday, June 16, 1914:

Plane Geometry	9 A. M. to 11 A. M.
German or French	11 A. M. to 1 P. M.
Arithmetic	2 P. M. to 4 P. M.

Applicants who wish to take the degree courses and cannot enter upon certificate must send to the Principal not later than June 9, for June examinations and September 1, for Fall Examinations, a list of the subjects which they offer for examination. The dates for these examinations will be in accordance with the above schedule.

Candidates failing to pass the June examinations are allowed to try again in September; those who cannot attend the June examinations may present themselves in September.



VIEW OF MANUFACTURED MATERIALS

REQUIRED SUBJECTS FOR ENTRANCE

Algebra

I. Fundamental operations, factoring, determination of the highest common factor and least common multiple, fractions, simple and complex, simple equations of one or more unknown quantities, problems involving linear equation of either numerical or literal quantities, radicals, involution, and evolution, square and cube root, ratio and proportion, exponents including fractional and negative.

II. Quadratic equations both numerical and literal. Simple problems involving one or more unknown quantities that may be solved by the methods of linear or quadratic equations, binomial theorem for positive integral exponents, problems involving methods of arithmetical and geometrical progressions.

Plane Geometry

The usual theorems and constructions of good text books including the general properties of plane rectilinear figures, the circle and the measurement of angles similar polygons, areas, regular polygons, and the measurement of the circle. The solution of original problems and problems in mensuration of lines and plane surfaces.

Arithmetic

(Diploma Course Requirement)

This subject should be pursued for two reasons: that the applicant may acquire familiarity with the fundamental principles and that he may acquire accuracy in solution. Special attention should be given to problems in percentage, interest, discount, square and cube root, alligation, ratio and proportion, Metric System.

English

As high schools, academies, and preparatory schools are following to a greater extent than heretofore, the requirements of the College Entrance Examination Board concerning the study of English Composition and Literature, the applicant to this school should be preparing for entrance examinations to conform to the suggestions of this Board.

The examination consists of two parts, both of which are given at the same time.

(a) With the object of testing the student's ability to express his thoughts in writing clearly and correctly he will be required to write upon subjects familiar to him. Emphasis will be laid upon the composition, punctuation, grammar, idiom and formation of paragraphs. He will be judged by how well he writes rather than by how much he writes.



BOILER ROOM

(b) The second part of the examination is prepared with the view of ascertaining the extent of the student's knowledge of good literature.

For 1913, 1914, and 1915, the list of study books is as follows:

Shakespeare's *Macbeth*.

Milton's *L'Allegro*, *Il Penseroso* and *Comus*.

Either,

Burke's *Speech on Conciliation with America*.

or both of the following:

Washington's *Farewell Address*.

Webster's *First Bunker Hill Oration*.

Either,

Macaulay's *Life of Johnson*.

or

Carlyle's *Essay on Burns*.

Modern Languages

REQUIREMENTS FOR DEGREE COURSES

It is expected that the work in these subjects has covered a period of at least two years of preparatory school training or the equivalent. Importance should be given to ability to translate into good idiomatic English, but attention should also be paid to grammar and construction that greater care may be used in translation.

Elementary German A

The entrance examination is composed of two parts, both taken, however, at the same time.

(a) Translation of simple German prose into good idiomatic English.

(b) Questions to test proficiency in grammar and simple English sentences to be rendered into German.

The requirements include the declension of articles, adjectives, pronouns, and nouns; the conjugation and inflection of weak and strong verbs; the simpler uses of the subjunctive; the use of the modal auxiliaries; the prepositions and their uses; the principal parts of important verbs and the elementary rules of syntax and word order.

Among the texts suggested for prospective candidates are:

Anderson's *Märchen*.

Arnold's *Fritz auf Ferien*.

Baumbach's *Die Nonna* and *Der Schwiegersohn*.

Gerstäcker's *Germelshausen*.

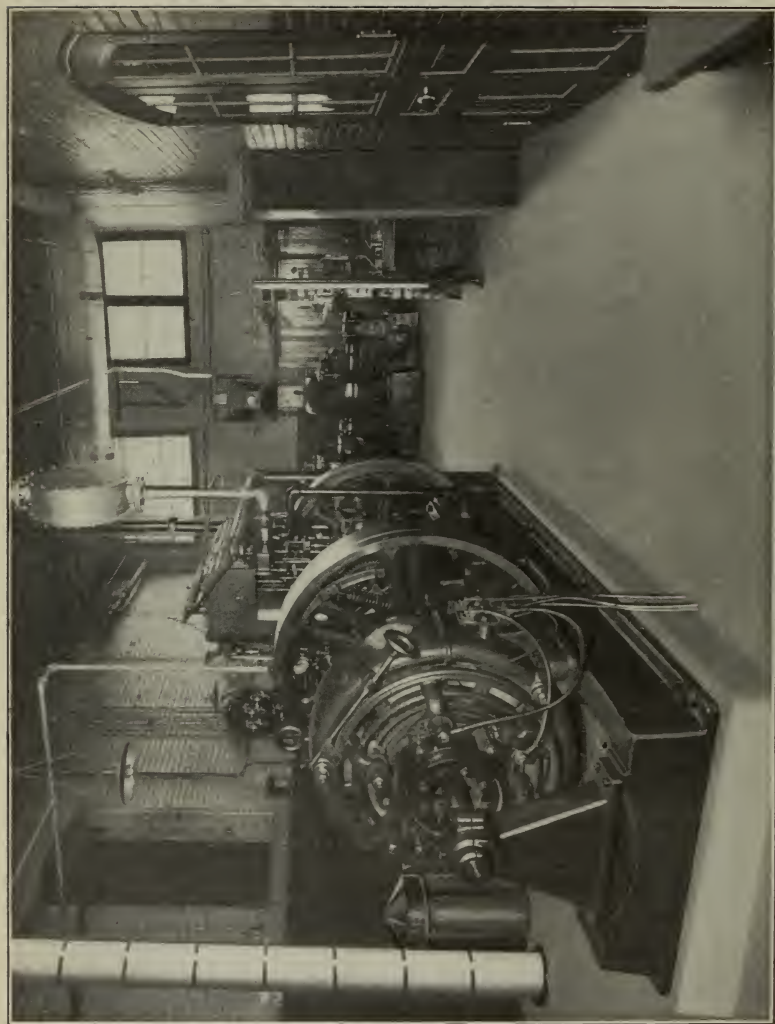
Heyse's *L'Arrabbiata*.

Hillern's *Höher als die Kirche*.

Jensen's *Die braune Erica*.

Storm's *Immensee*.

Zschokke's *Der zerbrochene Krug*.



GAS ENGINE UNIT—ENGINE ROOM

Elementary French A

The entrance examination is composed of two parts, both taken, however, at the same time.

- (a) Translation of simple French prose into good idiomatic English.
- (b) Questions to test proficiency in grammar and simple English sentences to be rendered into French.

The requirements include the principal parts, conjugation and inflection of the regular and the more common irregular verbs; the singular and plural forms of nouns and adjectives; the uses of articles and partitive construction; the forms and positions of personal pronouns; and the simpler uses of the conditional and subjunctive.

Among the texts recommended for prospective candidates are:

About's *Le roi des montagnes*.
Bruno's *Le tour de la France*.
Daudet's easier short tales.
De la Bédollière's *La mère Michel et son chat*.
Erckmann — Chatrian's *Madame Thérèse*.
Foa's *Contes Biographiques*.
Halévy's *L'Abbé Constantin*.
Merimée's *Colomba*.
Extracts from Michelet.
Sarcey's *Le siège de Paris*.
Verne's *Le tour du monde en quatre-vingts jours*.
Molot's, *sans famille*

Note:—Students who have pursued two years of Elementary French as well as two years of Elementary German may present one subject to cover 2 points in the required subjects and the other to cover 1 point in the elective subjects.

REQUIREMENTS FOR DIPLOMA COURSES

Elementary French B

Applicants who enter for one of the three year courses may present one year's work in French in a preparatory school. Those who present themselves for examination in this subject should be familiar with the rudiments of grammar and be able to translate simple French prose into good idiomatic English, also to translate into French, English sentences based on the French given for translation.

Elementary German B

Applicants who enter for one of the three year courses may present one year's work in German in a preparatory school. What is stated in regard to French applies to those who may present German instead of French.



LIBRARY

History

Applicants may offer a preparation of either American History or English History.

In American History applicants should be familiar with the early settlements in America, the colonies, their government, the customs of the people and events which led to the establishment of the United States. They should be informed concerning the causes and effects of the principal wars in which the country has been involved. They should be prepared to consider also questions requiring an elementary knowledge of Civil Government as well as historical facts connected with the growth of this country up to the present time.

For the subject of English History the course given in any reputable secondary school should give proper preparation. A course extending over a full year with not less than three periods a week will be accepted.

ELECTIVE SUBJECTS

History

If the applicant can present both English and American History he may include one as a required subject and the other as an elective subject.

Physics

The applicant should be familiar with the fundamental principles of Physics, particularly those considered under the headings of Mechanics, Heat, Light, Electricity and Magnetism. Text book instruction should be supplemented by lecture table experiments. Wherever possible, the student should pursue a laboratory course, but for the present no applicant will be conditioned in this subject if he has not been able to carry on a laboratory course. Where a laboratory course is offered by a preparatory school, it should cover at least twenty-five of those experiments listed in the syllabus of the College Entrance Examination Board. An applicant should present his note-book together with the certificate from the teacher under whom the work was performed.

Chemistry

Applicants must show evidence of their familiarity with the rudiments of Chemistry. Any course given in a preparatory school organized to present instruction by means of text book or lecture together with co-related laboratory work will be considered as covering the requirements. The applicant's note book with his original notes including description of experiments, apparatus used, reaction, observation, and deductions, must be accompanied by his instructor's certificate.

Importance will be placed upon manipulation and deductions as well as the general appearance and neatness of the note-book.

Solid Geometry

The usual theorems and constructions of good text books including the relations of planes and lines in space, the properties and measurement of prisms, pyramids, cylinders, and cones; the sphere and spherical triangles. The solution of original problems and the applications of the mensuration of surfaces and solids.

Trigonometry

The usual courses of instruction covered by the standard text books on Plane and Spherical Trigonometry will prepare an applicant sufficiently to meet this requirement.

Mechanical Drawing

The applicant must have pursued such a course in Mechanical Drawing that he will be familiar with the usual Geometrical Construction, Problems, Projection of Points, Lines, Planes, and Simple Solids.

Importance is laid not only upon the accuracy with which the work is performed but upon the general arrangement, appearance, and care with which the plates are executed.

Applicants are advised not to offer this subject as equivalent of the first term's work at the school.

Mechanic Arts

The usual courses offered by properly equipped preparatory schools will be accepted as suitable fulfilment of this requirement. Work should include instruction in the handling of both wood and metal working tools in the more simple practices of these arts.

Advanced French or German

In cases where applicants have pursued courses in French or German for more than two years, and have completed work which is more advanced than is included under Elementary French or German, they may offer the additional year as an elective.

English

In many preparatory schools this subject is required during all of the four years, and where it is pursued to this extent the applicant may offer the additional year's work as one of his elective subjects.

GENERAL INFORMATION

Preparation

Particular stress is laid upon a thorough grounding in mathematics including Algebra, Arithmetic and Plane Geometry, as these form the basis upon which the work of this school rests. While Solid Geometry is not required at the present time, the student will find a knowledge of this subject very valuable in his subsequent work and is strongly recommended to include this subject as one of his electives. A preliminary course in science, including Physics and Chemistry, serves to prepare the student's mind for the higher branches of these subjects and their application, but neither will be considered as the equivalent of the courses in these branches given in the school.

Advanced Standing

Candidates who may have received previous training in any of the subjects ordinarily taken in the regular course may present themselves for examination as per calendar. If a satisfactory rank be attained, they may elect such further work as their preparation will permit.

Attendance Card

At the beginning of each term all students must fill out and file with the Principal on blank forms which are provided, a formal application for such subjects as are required in his course and for which he is sufficiently prepared, subject to the approval of the Principal. When an attendance card is once approved, no change can be made except through the Principal.

Application Blanks

A blank form of application for admission may be found at the end of this bulletin. This should be properly filled out by all applicants whether entering upon certificate from a preparatory school or presenting themselves for examinations.

Fees

The fee for the day course is \$105 per year for residents of Massachusetts, with the exception of the Chemistry and Dyeing Course, for which the fee is \$130 for Second and Third Year students. For First Year students taking the Chemistry and Dyeing Course the first term fee is \$63 and the second term fee \$54.50. For non-residents the fee for all courses is \$155 per year. The fee for students from foreign countries is \$305 per year.

Three-fifths of the fee is charged for a single term and is payable on or before October 10, the balance on or before February 10, of each year. *No bills will be sent.* Students attending but one term will be charged three-fifths of the yearly fee. After payment is made, no fee or part thereof can be returned, except by special action of the Trustees.

Special students pay, in general, the full fee, but if a course be taken involving attendance at the school during a limited time, application may be made to the Principal for a reduction.

Students must provide their own books, stationery, tools, etc., and pay for any breakage or damage that they cause. The above fee includes free admission for any day student desiring to attend any of the evening classes in which there is accommodation.

For all first year students a minimum deposit of \$20 is required to cover the cost of breakage in the chemical laboratory, the unexpended balance to be returned to the student at the end of the year.

For all students in second or third years taking work in Chemistry or Dyeing Laboratories a deposit of \$15 per term is required. The unexpended balance will be returned at the end of the year.

Fees are strictly payable in advance, and students whose fees remain unpaid after the above mentioned dates will not be admitted to classes.

All deposits must be made before students can be admitted for laboratory work.

Examinations

Examinations are held at the end of each term.

In general, the examinations cover the work of the preceding term, but at the end of the third year, candidates for diplomas may be examined on all the preceding three years' work.

Examinations for students conditioned in first term subjects are held in May and examination for students conditioned in the Final Examinations are held in September following.

If a student fails to clear a condition at the time appointed, he will be required to repeat or drop the subject; and he cannot be admitted to subjects dependent thereon.

Intermediate examinations are held every five weeks and these serve to inform the student concerning his standing and the progress made.

Daily work and regularity of attendance are considered in making up the reports of standing.

Continued or persistent absence or tardiness from the classes is considered reason to exclude a student from the class.

Records and Reports of Standing

Twice during each term informal reports are sent to all parents or guardians and to students who are of age; and at the end of each term formal reports are made.

The daily work of the student forms an important part of his record, and no pupil will be awarded the diploma unless this portion of his record is clear.

Books are prescribed for study, for entry of lecture notes and other exercises, and are periodically examined by the lecturers. The care and accuracy with which these books are kept are considered in determining standing.

Thesis

All candidates for the degrees of the school must file with the Principal not later than May 15, a report of original investigation, or research, written on a good quality of paper, 8 x 10 inches, with one inch margin at left, and 1-2 inch at right of each page; such thesis to have been previously approved by the head of the department in which it is made.

For all candidates for the diploma this requirement will be optional on the part of the school.

Graduate Course

Graduates of technical courses of other schools are invited to communicate with the Principal with reference to special courses in the textile studies. Previous training in the engineering branches will usually reduce materially the time necessary to complete any of the courses at this school. The advantages offered to such persons for special research work are unexcelled, and a most profitable course may be arranged.

Partial Courses

While it is assumed that in general every student will pursue some one of the regular courses it is recognized that there may be some who because of special vocations or limited time desire to obtain instruction in certain particular subjects. Facilities and special courses will be provided for such applicants within the limits of schedule arrangements and required preparation. For subjects and preparation see page 109.

Applicant must present satisfactory evidence by examination or otherwise that he is qualified to pursue with profit the subjects chosen.

For a number of years the school has had students who have specialized in Textile Design, Decorative Art, Cloth Analysis, Weaving and Finishing. While no specified limit is given for this course the usual time has been three years. It is expected that students taking this course will devote all of the regular school session to these subjects and failure to attend, continued tardiness, lack of application or progress will be considered sufficient reasons to demand his withdrawal from the school.

Special Awards of Merit

For several years a friend of the school has offered prizes in the form of books to be awarded to the successful candidates on graduation day. The prizes are continued each year. The conditions in detail are as follows:

First:—Ten dollars to the student taking the regular Chemistry and Dyeing Course who shall be considered as having attained the highest scholarship in First Year Chemistry.

Second:—Five dollars to the student taking the regular Chemistry and Dyeing Course who shall be considered as having attained the second highest scholarship in First Year Chemistry.

Third:—Ten dollars to the regular student of the Chemistry and Dyeing Course who shall be considered as having attained the highest scholarship during his second year.

Fourth:—Five dollars to the regular student of the Chemistry and Dyeing Course who shall be considered as having attained the second highest scholarship during his second year.

Fifth:—Twenty dollars to the regular student in the Chemistry and Dyeing Course who shall present the best Thesis preparatory to graduation.

The above mentioned sums are to be invested in books which may be selected after graduation. In case no one is considered as being worthy of any particular scholarship prize, the same may be withheld. The decision in such case shall rest with the judges.

Prize Offers for Textile Designs

The Arlington Mills make the following prize offers for textile design to all members of the day classes, providing that there are at least two contestants, and to all members of the evening classes, providing that there are at least two contestants:

First and second prizes will be given to the winners in each contest.

First:—Cash prize of \$25.00 to the student who presents the best design with full specifications which is suitable for worsted dress goods fabrics for women's wear.

Second:—Cash prize of \$15.00 to the student who presents the second best design, with full specifications, applicable to the above fabrics.

Any contestant may present not more than five different designs for any one of the above mentioned fabrics.

No contestant will be eligible for more than one prize.

Specifications should be made upon standard thesis paper. Only one side should be used and subject matter should be either typewritten or presented in a clear legible handwriting. With each design a statement must be submitted telling the kind of fabric and finish intended.

Any or all designs submitted may be retained by the donors and may become their property.

The judges will be appointed by the Arlington Mills.

All designs must be delivered to the Arlington Mills, 78 Chauncy Street, Boston, on or before May 15, accompanied by a sworn statement that the contestant has received no help and that the designs are entirely his own work, the object of the contest being to develop originality in the student.

The full name of a contestant must appear on the designs and specifications. In judging the relative merit of the various designs the neatness and care with which they are executed will be considered as well as the value of the designs from a manufacturer's point of view.

Degrees

The degree of Bachelor of Textile Engineering will be awarded for the completion of the four-year course in Textile Engineering. The degree of Bachelor of Textile Dyeing will be awarded for the completion of the four-year course in Chemistry and Textile Coloring.

Diploma

For the present the diploma of the School will be awarded upon the satisfactory completion of any one of the regular courses, covering not less than three years, except where entrance is to advanced standing. In such cases at least one year's attendance is required.

Medals of Honor

The National Cotton Manufacturers' Association offers annually a medal to that member of the third year class who shall have during his course attained the highest standing in the specified subjects required by the vote of the association.

Attendance

All regular students must attend all exercises of their course. Special students must attend exercises as per their Tabular View.

In case of absence explanation must be made to the instructor or the Head of the Department. The effect of such absence upon a student's standing in the respective study will rest with the Head of the Department, subject to the approval of the Principal.

If a student absents himself from any department to such an extent that in the mind of the Head of the Department he is endangering his standing, he shall be reported to the Principal.

If he continues his non-attendance, he may be required to drop the subject and repeat it the following year.

If he is reported from several departments on account of non-attendance, he may be suspended from the school for the remainder of the school year.

Conduct

Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order. All breakages, accidents, or irregularities of any kind must be reported immediately to the head of the department, or instructor in charge.

In case of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly or ungentlemanly conduct or general insubordination, are considered good and sufficient reason for the immediate suspension of a student, and a report to the Trustees for such action as they deem necessary to take.

It is the aim of the Trustees so to administer the discipline of the school as to maintain a high standard of integrity and a scrupulous regard for trust. The attempt of any student to present as his own, work which he has not performed, or to pass any examination by improper means, is regarded by the Trustees as a most serious offense and renders the offender liable to immediate suspension or expulsion. The aiding or abetting of a student in any dishonesty is also held to be a grave breach of discipline.

Any student who violates these provisions will be immediately suspended by the Principal and the case reported at the following meeting of the Trustees for action.

Young men abounding in vitality when suddenly cut loose from home and established social environment to acquire an education at a residential school, need especially the careful direction of more mature minds in the formation of new associations. The management of all residential schools are aware that this fact is the cause of considerable anxiety on the part of parents and guardians. The responsibility thus placed upon those under whose care these pupils are committed is profoundly recognized.

The public schools are for boys and girls, the college for youth, the higher technical and professional schools of medicine, law, engineering, etc., are for men. It is now fully recognized that the fundamental idea of the general educational system, from the kindergarten to the college inclusive, should be the development and establishment of character, and it is therefore expected that those entering the technical schools will have made some progress in self-respect, self-denial and self-control. They enter substantially upon their life work when they matriculate at the higher technical schools and may be placed on their honor as to conduct and not be subject to an irritating and humiliating system of espionage outside of school hours.

In place of such espionage it is the policy of technical schools to rely mainly upon the discipline of the work of the course in connection with facilities for physical exercise in the various athletic games and sports, for which ample provision has been made at this school.

Pupils often err in conduct from thoughtlessness and lack of experience rather than through wilfulness, and unconsciously fall into bad habits because of the lack of intelligent warning and instruction. For this reason, it is proposed to give thorough instruction by lectures, covering the subjects of hygiene, the preservation of physical vigor, morals, thrift and the duties of citizenship. A careful scrutiny will also be maintained by the instructing staff in order to detect in the students any tendency of relaxation in the work or attendance, and all reasonable effort will be made to maintain a high standard of scholarship and morals.

Library

The school library is supplied with leading textile books and with works dealing with science, art or industries allied to the textile trades. The leading textile papers are kept on file.

Sessions

The regular school sessions are in general from 8.30 a. m. to 12.30 p. m., and from 2 to 4.30 p. m., except Wednesdays and Saturdays when there is no session of the school in the afternoon. On Saturday afternoons the buildings are closed.

A tabular view designates the hours at which the various classes meet. This is rigidly adhered to and the student is marked for his attendance and work as therein scheduled.

Residence and Expenses

Students from a distance, requiring rooms and board in the city, may if they desire, select the same from a list which is kept at the School. The cost of rooms and board in a good district is from \$6.50 per week upwards.

All raw stock and yarn provided by the School, and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student is allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated in accordance with the requirements of the school. It is understood that the Trustees may retain in the School such specimens of student's work as they may determine.

Lockers are provided for the use of the students, sufficiently capacious to contain clothing, books and tools. The student must provide a good padlock with duplicate keys, one of which must be delivered at the school office where it will be preserved for use while the student remains at school.

No books, instruments, or other property of the School are loaned to the students to be removed from the premises except by special permission.

Awards

Gold Medal, Paris Exposition, 1900, for general excellence. A special Medal, Merchants and Manufacturers Exposition, Boston, 1900. The Pan-American Medal awarded to the School, 1901. Gold Medal, Louisiana Purchase Exposition, 1904, Gold Medal, Lewis and Clarke Centennial Exposition, 1905.

Bulletins and Catalogue

All students registering and paying the regular fee for the course selected are entitled to the Bulletins and Catalogues when issued.

Courses of Instruction

Since its establishment, the Lowell Textile School has offered courses, each of which extends over a three year period. With the development of the school and close study of the problems presented to the graduates, it has been believed that attention should be given those branches of instruction which would give breadth of training as well as establish fundamental principles. This policy has resulted in extending the curriculum to such length that the need for an additional year's instruction was evident.

The fact was also appreciated that to carry on the more advanced work the better preparation must be demanded of the applicants for entrance.

Nevertheless it was recognized that many young men seeking employment in the textile industry do not care, or are not in a position to devote four years to scholastic preparation, and for these the regular three year courses are offered.

These courses are designated as:—

Cotton Manufacturing.

Wool Manufacturing.

Textile Design (General Textile Courses)

Chemistry and Dyeing.

Textile Engineering.

At the completion of any one of these the regular diploma of the school is awarded.

In general it is assumed that students pursuing these courses will not take the advanced work of the fourth year. However, if a student electing one of the three year courses desires to change to one of the four-year courses he may do so providing his preparation and undergraduate standing permits of it.

For those who desire and who have the proper entrance qualifications to pursue the more advanced work in Textile Engineering, and Chemistry and Textile Coloring, four-year courses are offered at the completion of which the degrees of Bachelor of Textile Engineering (B. T. E.) and Bachelor of Textile Dyeing (B. T. D.) are conferred.

Three options are offered in the Engineering Course, viz: General Textile, Cotton Manufacturing, or Wool Manufacturing. Each of these courses is planned to train one in the fundamental principles of science found to be applicable in the particular fields of Textile Chemistry and Textile Engineering. It is maintained that for one to be successful in either of these important branches of industry, as thorough and broad a training is required as in any of the recognized branches of engineering or of applied science.

With this in mind these courses have been built of a secure framework of science and mathematics, and to it has been added the useful application of those branches in the broad textile field. With the direct purpose of laying a secure foundation in the training a more extended and advanced preparatory course is first demanded, and subsequently in the school work more subjects of a general character are included, that narrowness of judgment and observation may not result by over stimulation of the technical development.

COURSES FOR WOMEN

Although all classes are open to women the courses which have appealed especially to their tastes have been Textile Designing and Decorative Art. Some have pursued courses in Chemistry and have added to their work in Design some instruction in Power Weaving and Finishing. These special courses have in general been followed for three years and in some cases have led the students to positions either in the mill office or in some commercial lines that have been desirable and have offered congenial work.

As the school work is usually special to meet the needs of each case, no prescribed course of study is given in this catalogue. Inquiries should be made of the Principal.

Courses

In the column headed "Hours of Exercise" the numbers represent for each particular subject the total hours required for a period of fifteen weeks.

The letter and number which follow the subjects indicate the department in which the subject is given and the number of the subject in that department. For detail description of the same, see page 109.

The departments are indicated as follows:

Textile Engineering	B	Cotton Yarns	F
Chemistry and Dyeing	C	Woolen and Worsted Yarns	G
Textile Design and Power		Finishing	H
Weaving	D	Physical Culture	I
Languages and History	E		

By referring to the letter and number indicated under "Preparation" the student can ascertain what subjects are necessary in order that he may have a clear understanding of the subject which he is scheduled to take.

FIRST YEAR

FIRST TERM

(Common to all courses)

	Hours of Exercise
Mechanism B-3	60
Mechanical Drawing B-7	60
Mathematics B-1	45
Textile Design D-1	60
Elementary Chemistry C-1	150
English E-1	30
Elementary German E-2 or Elementary French E-4	30
Physical Culture I-1	30

SECOND TERM

	Courses I-4	Courses II-4
Mechanism B-3	45	45
Mechanical Drawing B-8	75	30
Mechanical Laboratory B-6	37	—
Mathematics B-1	45	30
Textile Design D-1	60	—
Elementary Chemistry C-1	75	75
Cotton Yarn F-1 or Wool Yarn G-1	60	—
English E-1	30	30
Elementary German E-2 or Elementary French E-4	45	45
Physical Culture I-1	30	30
Qualitative Analysis C-2	—	157
Stoichiometry C-3	—	30

For second term subjects in three-year courses see pages 99-107.

COURSE I-4.—TEXTILE ENGINEERING

At the organization of the school four major courses were offered but with the growth of the school a demand was felt for instruction in engineering subjects supplemented by a study of textile machinery and processes. A three year course to meet this demand was offered and the development of this through a study of the possible requirements of a Textile Engineer has made evident a broader course of four years which leads to the degree of Bachelor of Textile Engineering (B. T. E.).

The subjects of the first year which are substantially the same for all courses are intended to lay the foundation for the subsequent dependent instruction in the applied courses. Hence, the subjects of Mathematics, Chemistry, Mechanism, and Mechanical Drawing not only operate to develop the mind and stimulate accurate thinking, but also set forth the principles which are later to be used in a clear understanding of machines and methods. The course in Elementary Designing acquaints the student with textile fabrics and their construction. The subjects of English and one foreign language give the student a better understanding of his own language that he may express himself clearly, and by acquaintance with a foreign language he may obtain information not available in his own tongue.

In the second term instruction in Cotton Yarn Manufacture commences. This is continued into the second year followed in the succeeding years by Wool Manufacturing, Weaving, and Finishing. Chemistry of the first year develops into Textile Chemistry and Dyeing of the second year, and during this year an advanced course of Physics is given, leading to Electrical Engineering and its application in the textile industry. Mathematics are finished with the third year and during the course the branches of higher Algebra, Trigonometry, Analytical Geometry, and Calculus are studied with particular reference to the solution of engineering problems, particularly in the subjects of Applied Mechanics, Electrical, Heat, and Mill Engineering, which are a part of the second, third, and last years' work.

The fourth year permits of a pursual of more advanced work in Mill Engineering, Electrical and Heat Engineering, as well as some further instruction in those textile processes of Worsted Spinning, Cotton Finishing, etc., for which three years' time does not permit. It is also proposed to offer general courses of Business Law, Accounting and Principles of Efficiency Engineering under the head of Business Administration.

For detailed description of the subjects see page 109.

COURSE I-4.—TEXTILE ENGINEERING

General Textile Option

(For First Year see page 91)

SECOND YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Textile Chemistry and Dye- ing	C-9 30	Engineering Laboratory	B-14 30
Physics	B-11 30	Weaving Mechanism	B-5 30
Mathematics	B-2 45	Shop Work	B-15 60
Applied Mechanics	B-4 30	Cotton Yarn Manufacture	F-1 90
Machine Drawing	B-10 75	Advanced German or French	E-3-5 30
Steam Engineering	B-12 45	Industrial History	E-6 15

SECOND TERM

Textile Chemistry and Dye- ing	C-9 15	Shop Work	B-15 60
Physics	B-11 45	Wool Yarn Manufacture	F-1 97
Mathematics	B-2 45	Steam Engineering	B-12 30
Applied Mechanics	B-4 30	Advanced German or French	E-3-5 30
Machine Drawing	B-10 60	Industrial History	E-6 15
Engineering Laboratory	B-14 37	Power Weaving	D-9 37

THIRD YEAR

FIRST TERM

Electrical Engineering	B-20 52	Power Weaving	D-9 45
Machine Shop Practice	B-15 60	Economics	E-7 30
Engineering Laboratory	B-14 30	Mathematics	B-2 45
Woolen and Worsted Yarn Manufacture	G-1 90	Mill Engineering	B-17 120
		Woolen and Worsted Finishing	H-1 30

SECOND TERM

Hydraulics	B-13 30	Woolen and Worsted Yarn Manufacture	G-1 90
Electrical Engineering	B-20 53	Power Weaving	D-10 45
Mill Engineering	B-17 105	Economics	E-7 30
Machine Shop Practice	B-15 60	Woolen and Worsted Finishing	H-1 67
Engineering Laboratory	B-14 30		

FOURTH YEAR

FIRST TERM

Mill Engineering	B-17 105	Mill Power Plants	90
Engineering Laboratory	B-14 60	Cotton Finishing	H-2 30
Electrical Engineering	B-20 30	Business Administration	E-8 45
Machine Shop Practice	B-15 60	Textile Testing	30
Woolen and Worsted Yarn Manufacture	G-1 60		

SECOND TERM

Mill Engineering	B-17 90	Mill Power Plants	60
Engineering Laboratory	B-14 60	Business Administration	E-8 45
Electrical Engineering	B-20 30	Thesis	120
Cotton Finishing	H-2 60	Textile Testing	45

COURSE I-4.—TEXTILE ENGINEERING

Cotton Option

(For First Year see page 91)

SECOND YEAR

		FIRST TERM			
		Hours of Exercise			Hours of Exercise
Textile Chemistry and Dye- ing	C-9	30	Weaving Mechanism	B-5	30
Physics	B-11	30	Shop Work	B-15	60
Mathematics	B-2	45	Cotton Yarn Manufacture	F-1	60
Machine Drawing	B-8	75	Cotton Design	D-2	45
Engineering Laboratory	B-14	30	Advanced German or French	E-3, 5	30
Steam Engineering	B-12	45	Industrial History	E-6	15
SECOND TERM					
Textile Chemistry and Dye- ing	C-9	15	Shop Work	B-15	60
Physics	B-11	45	Cotton Yarn Manufacture	F-1	60
Mathematics	B-2	45	Cotton Design	D-2	45
Applied Mechanics	B-4	30	Power Weaving	D-9	30
Machine Drawing	B-8	60	Advanced German or French	E-3, 5	30
Engineering Laboratory	B-14	37	Industrial History	E-6	15
Steam Engineering	B-12	30			

THIRD YEAR

		FIRST TERM			
Electrical Engineering	B-20	52	Power Weaving	D-9	45
Machine Shop Practice	B-15	60	Economics	E-7	30
Mill Engineering	B-17	103	Engineering Laboratory	B-14	30
Cotton Yarn Manufacture	F-1	100	Mathematics	B-2	45
Cotton Design	D-6, 7	45			
SECOND TERM					
Hydraulics	B-13	30	Cotton Yarn Manufacture	F-1	82
Electrical Engineering	B-20	53	Cotton Design	D-6, 7	45
Power Plants	B-18	30	Power Weaving	D-9	45
Machine Shop Practice	B-15	60	Economics	E-7	30
Mill Engineering	B-17	105	Engineering Laboratory	B-14	30

FOURTH YEAR

		FIRST TERM			
Mill Engineering	B-17	105	Cotton Design	D-6, 7	45
Engineering Laboratory	B-14	60	Cotton Finishing	H-2	30
Electrical Engineering	B-20	30	Power Weaving	D-10	30
Cotton Yarn Manufacture	F-1	45	Business Administration	E-8	45
Mill Power Plants		90	Textile Testing		30
SECOND TERM					
Mill Engineering	B-17	90	Textile Testing		45
Engineering Laboratory	B-14	60	Cotton Finishing	H-2	60
Electrical Engineering	B-20	30	Business Administration	E-8	45
Mill Power Plants		60	Thesis		120

COURSE I-4.—TEXTILE ENGINEERING

Wool Option

(For First Year see page 91)

SECOND YEAR

		FIRST TERM			
		Hours of Exercise			Hours of Exercise
Textile Chemistry and Dye- ing	C-9	30	Woolen and Worsted Yarn Manufacture	G-1	90
Physics	B-11	30	Woolen and Worsted Design	D-3	30
Mathematics	B-2	45	Advanced German or French	E-3, 5	30
Machine Drawing	B-8	75	Industrial History	E-6	15
Weaving Mechanism	B-5	30	Steam Engineering	B-12	45
Engineering Laboratory	B-14	30			
Shop Work	B-15	60			

SECOND TERM

Textile Chemistry and Dye- ing	C-9	15	Woolen and Worsted Yarn Manufacture	G-1	68
Physics	B-11	45	Woolen and Worsted Design	D-3	45
Mathematics	B-2	45	Power Weaving	D-9	30
Applied Mechanics	B-4	30	Advanced German or French	E-3, 5	30
Machine Drawing	B-8	60	Industrial History	E-6	15
Engineering Laboratory	B-14	37			
Shop Work	B-15	60			
Steam Engineering	B-12	30			

THIRD YEAR

FIRST TERM

Electrical Engineering	B-20	52	Woolen and Worsted Design	D-6, 7	45
Machine Shop Practice	B-15	60	Power Weaving	D-9	45
Mathematics	B-2	45	Economics	E-7	30
Mill Engineering	B-17	103	Engineering Laboratory	B-14	30
Woolen and Worsted Yarn Manufacture	G-1	100			

SECOND TERM

Hydraulics	B-13	30	Woolen and Worsted Yarn Manufacture	G-1	90
Electrical Engineering	B-20	53	Woolen and Worsted De- sign	D-6, 7	45
Mill Engineering	B-17	105	Power Weaving	D-9	45
Machine Shop Practice	B-15	60	Economics	E-7	30
Engineering Laboratory	B-14	30			

FOURTH YEAR

FIRST TERM

Mill Engineering	B-17	105	Woolen and Worsted Design	D-6, 7	45
Engineering Laboratory	B-14	60	Woolen and Worsted Finishing	H-1	30
Electrical Engineering	B-20	30	Power Weaving	D-10	30
Woolen and Worsted Yarn Manufacture	G-1	45	Business Administration	E-8	45
Mill Power Plants		90	Textile Testing		30

SECOND TERM

Mill Engineering	B-17	90	Woolen and Worsted Finishing	H-1	60
Engineering Laboratory	B-14	60	Business Administration	E-8	45
Electrical Engineering	B-20	30	Thesis		120
Mill Power Plants		60	Textile Testing		45

COURSE II-4.—CHEMISTRY AND TEXTILE COLORING

The Four Year Course in Chemistry and Textile Coloring leading to the degree of B. T. D. is especially intended for those who wish to engage in any branch of Textile Chemistry, Textile Coloring, Bleaching, Finishing, or the manufacture and sale of the dyestuffs or chemicals used in the textile industry. The theory and practice of all branches of dyeing, printing, bleaching, scouring, and finishing are taught by lecture work supplemented with a large amount of experimental laboratory work and actual practice in the dye-house and finishing room.

The underlying theories and principles of chemistry are the same no matter to what industry the application is eventually made. Furthermore, no industry involves more advanced and varied applications of the science of chemistry than those of the manufacture and application of the coal-tar coloring matters. In addition, the Textile Colorist must consider the complex composition of the textile fibres, and the obscure reactions which take place between them and the other materials of the textile industry.

During the first year General Chemistry including both Inorganic and Organic is taught by lectures and laboratory work, and this is supplemented during the second term by Qualitative Analysis and Stoichiometry.

Advanced Inorganic Chemistry as well as Advanced Organic Chemistry are studied throughout the second year as a continuation of the Elementary Chemistry of the first year, and much time is spent upon Quantitative Analysis, Industrial Chemistry, and Textile Chemistry and Dyeing.

The foundation work in General Chemistry is continued during the third year with courses in Physical Chemistry, Organic laboratory work, and analytical work. The subject of Industrial Chemistry is introduced and much time is devoted to Advanced Textile Chemistry, Dye Testing, Color Matching, Calico Printing, and Woolen, Worsted, and Cotton Finishing.

The fourth year is characterized by an endeavor to present certain subjects of a more applied nature in such a manner that the student's reasoning power and ability to apply the knowledge gained during the first three years may be developed to the fullest extent. The subject of Engineering Chemistry is introduced and the work in the Dyeing and Analytical laboratories is applied as far as possible to the actual requirements of the factory chemist and colorist. The student is given a thorough course in Microscopy, Photomicrography and the use of the various instruments such as the Spectroscope, Ultra-microscope, Polariscope, Tintometer, etc., which often prove of vital importance in the advanced study of Textile Chemistry. During this fourth year, the student must devote much time to research work, or the original investigation of some assigned subject, upon which he must present a satisfactory thesis, or report, before receiving his degree.

For detailed description of the subjects see page 109.

COURSE II-4.—CHEMISTRY AND TEXTILE COLORING

(For First Year see page 91)

SECOND YEAR

		FIRST TERM			
		Hours of Exercise			Hours of Exercise
Advanced Inorganic Chemistry	C-4	45	Steam Engineering	B-12	45
Textile Chemistry and Dyeing	C-9	68	Physics	B-11	30
Quantitative Analysis	C-6	150	Industrial History	E-6	15
Industrial Laboratory	C-12	105	Advanced German or French	E-3, 5	30
			Power Weaving	D-9	22

SECOND TERM

Advanced Inorganic Chemistry	C-4	45	Quantitative Analysis	C-6	150
Advanced Organic Chemistry	C-5	45	Industrial Laboratory	C-12	67
Textile Chemistry and Dyeing	C-9, 10	128	Physics	B-11	30
			Industrial History	E-6	15
			Advanced German or French	E-3, 5	30

THIRD YEAR

		FIRST TERM			
		Hours			Hours
Advanced Textile Chemistry and Dyeing	C-14	210	Physical Chemistry	C-8	30
Industrial Chemistry	C-13	30	Woolen and Worsted	H-1	30
Quantitative Analysis	C-7	150	Finishing	C-21	30
Advanced Organic Chemistry	C-5	30	Technical German		

SECOND TERM

Advanced Textile Chemistry and Dyeing	C-14	150	Organic Chemistry Laboratory	C-15	105
Industrial Chemistry	C-13	30	Woolen and Worsted		
Quantitative Analysis	C-7	120	Finishing	H-1	60
Physical Chemistry	C-8	15	Technical German	C-21	30

FOURTH YEAR

		FIRST TERM			
		Hours			Hours
Quantitative and Industrial Analysis	C-7, 17	90	Advanced Organic Chemistry	C-5	120
Advanced Textile Chemistry and Dyeing	C-14	90	Technical German	C-21	30
Engineering Chemistry	C-16	15	Advanced Organic Chemistry (Dyestuffs)	C-20	15
			Thesis	C-19	150

SECOND TERM

Quantitative and Industrial Analysis	C-7, 17	75	Microscopy and Photomicrography	C-18	75
Advanced Organic Chemistry	C-5	120	Thesis	C-19	225

COURSE 1-3.—COTTON MANUFACTURING

The Cotton Manufacturing Course is designed for students contemplating a career in the manufacturing of cotton yarns and cloths or allied industries and who wish to devote but three years to the school work.

During the first year, the studies are common to all courses and include instruction in mechanism, mathematics, mechanical drawing and elementary chemistry. Laboratory work supplements the lectures in chemistry and hand loom weaving assists in illustrating the principles of textile design.

The work in the Cotton Yarn Department comprises instruction in all the processes from the bale to the finished yarn. The instruction consists of lectures upon the machines and processes, and laboratory work upon the machines themselves. In the laboratory each student is required to make exhaustive tests upon each machine and all the settings and adjustments possible. The third year's work in this department is largely devoted to lectures upon the manufacture of specialties, waste products, etc., and special laboratory work, special tests upon yarns and fabrics, mill planning with regard to the arrangement of machinery and other work of an advanced nature.

The course in chemistry consists of lecture and laboratory work on inorganic and organic chemistry followed by instruction in textile chemistry and dyeing, including a short course in the dyeing laboratory.

The work in mechanism is followed by steam engineering, electricity, hydraulics and mill engineering. The mechanical drawing taken in connection with these subjects augments this instruction as well as provides opportunity for students to become skilled in draughting.

The course in textile designing, cloth analysis, and cloth construction includes lectures on plain and fancy weaves and Jacquard work, the analysis of all commercial fabrics, and designs for the same. During the third year of this course students in this department specialize on cotton fabrics.

Power weaving is taken up during the second and third years. Commencing with lectures and practice upon plain looms, the student is taken through dobby and box-loom weaving to Jacquards.

A course in knitting taken during the third year includes the manufacture of hosiery and underwear. There is also a course on the finishing of cotton fabrics which is given by lectures and laboratory work.

For detailed description of the subjects see page 109.

COURSE I-3.—COTTON MANUFACTURING

(For First Term see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mechanism	B-3 45	Elementary Chemistry	C-1 75
Mechanical Drawing	B-8 75	Elementary German or	E-2 } 45
Mathematics	B-1 30	Elementary French	E-4 }
Textile Design	D-1 83	Physical Culture	I-1 30
Cotton Yarn Manufacture	F-1 97	English	E-1 30

SECOND YEAR

FIRST TERM

Cotton Yarn Manufacture	F-1 240	Machine Drawing	B-10 30
Textile Design	D-2 60	Steam Engineering	B-12 45
Power Weaving	D-9 30	Weaving Mechanism	B-5 30
Textile Chemistry and Dye- ing	C-9 30	Physics	B-11 30
		Industrial History	E-6 15

SECOND TERM

Cotton Yarn Manufacture	F-1 173	Machine Drawing	B-10 30
Textile Design	D-2 60	Applied Mechanics	B-4 30
Power Weaving	D-9 75	Physics	B-11 30
Textile Chemistry and Dye- ing	C-9, 11 82	Industrial History	E-6 15

THIRD YEAR

FIRST TERM

Cotton Yarn Manufacture	F-1 180	Power Weaving	D-10 158
Knitting	F-2 30	Cotton Finishing	H-2 30
Textile Design, Cloth Con- struction	D-6, 7 67	Electricity	B-20 15
		Mill Engineering	B-17 30

SECOND TERM

Cotton Manufacture	F-1 181	Mill Engineering	B-17 45
Knitting	F-2 37	Power Weaving	D-10 97
Textile Design, Cloth Con- struction	D-6, 7 60	Cotton Finishing	H-2 60
Hydraulics	B-13 30	Thesis	

COURSE II-3.—WOOL MANUFACTURING

The course of Wool Manufacturing is arranged for those who contemplate a career in the manufacture of woolen or worsted fabrics and can devote but three years to the school work. It includes instruction in all of the varied processes employed in adapting the wool fibre to cloth, namely,—sorting, scouring, carding, combing, spinning, designing, weaving, dyeing and finishing. The work is carried on by lectures, recitations and practical work in the laboratories.

Following the first term of the first year, which is common to all courses, the student commences work in the Woolen and Worsted Laboratory, and through systematic steps becomes acquainted with the machines employed in the first steps of yarn manufacturing. At the same time lectures are given upon the many kinds of wool, variation in quality, grades, uses, etc., as influenced by the locality where grown. This is followed by practical work on the sorting table.

The second and third years cover spinning of woolen yarn and worsted yarn by the Bradford and French systems, also the manufacture of tops, including combing, gilling and back washing. Scouring and carbonizing are taken up in detail by lectures and by practical work.

The general chemistry of the first year is followed by textile chemistry and dyeing in the second year. This includes a short course in the Dyeing Laboratory.

Textile design, cloth analysis and construction are continued from the first year throughout the course, the work being applied especially to woolen and worsted goods. Weaving on power looms commences in the second year and continues through the third.

Lectures on finishing commence with the third year and are augmented by extensive practice with the machines in the Finishing Department.

Work in the Engineering Department extends throughout all three years and includes mechanical drawing, properties of saturated steam, electricity and hydraulics. The practical application of the principles studied in these subjects is brought out forcibly in the work on mill engineering, where mill design and construction are considered. A short course covering methods employed in the testing of fibres, yarns and cloths, together with laboratory work in the manipulation of certain physical apparatus, is given in the third year.

For detailed description of the subjects see page 109.

COURSE II-3.—WOOL MANUFACTURING

(For First Term see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mechanism	B-3 45	Elementary Chemistry	C-1 75
Mechanical Drawing	B-8 75	Elementary German or	E-2 } 45
Mathematics	B-1 30	Elementary French	E-4 }
Textile Design	D-1 83	Physical Culture	I-1 30
Wool Yarn Manufacture	F-1 97	English	E-1 30

SECOND YEAR

FIRST TERM

Woolen and Worsted Yarn		Machine Drawing	B-10 30
Manufacture	G-1 240	Steam Engineering	B-12 45
Textile Design	D-3 60	Weaving Mechanism	B-5 30
Power Weaving	D-9 30	Physics	B-11 30
Textile Chemistry and Dye- ing	C-9 30	Industrial History	E-6 15

SECOND TERM

Woolen and Worsted Yarn		Machine Drawing	B-10 30
Manufacture	G-1 173	Applied Mechanics	B-4 30
Textile Design	D-3 60	Physics	B-11 45
Power Weaving	D-9 75	Industrial History	E-6 15
Textile Chemistry and Dye- ing	C-9, 11 82		

THIRD YEAR

FIRST TERM

Woolen and Worsted Yarn		Power Weaving	D-10 120
Manufacture	G-1 128	Woolen and Worsted	
Knitting	F-2 30	Finishing	H-1 75
Textile Design, Cloth Con- struction	D-6, 7 67	Electricity	B-20 30
		Mill Engineering	B-17 30

SECOND TERM

Woolen and Worsted Yarn		Mill Engineering	B-17 45
Manufacture	G-1 158	Power Weaving	D-10 135
Knitting	F-2 37	Woolen and Worsted	
Textile Design, Cloth Con- struction	D-6, 7 60	Finishing	H-1 75
Hydraulics	B-13 30	Thesis	

COURSE III-3.—TEXTILE DESIGN

(General Textile Course)

The general course in Textile Design is planned to meet the demand of young men for a technical training in the general processes of textile manufacturing, but with particular reference to the design and construction of fabrics. To this end a foundation is laid in the first year by instruction in the elementary principles of designing, decorative art and weaving. That he may later in the course pursue to advantage instruction in yarn manufacturing, weaving, dyeing, finishing and some engineering problems, a foundation course in mechanics, mathematics and chemistry is laid. As the student is required to pursue courses in the yarn departments, both cotton and wool, he acquires a knowledge of the manufacture of cotton yarns from the bale to the yarn and of woolen and worsted yarns from the fleece through the varied processes of manufacturing woolen yarn or worsted yarn by both the French and Bradford Systems.

Throughout his entire course he receives instruction in design, cloth analysis and construction of all the standard cloths, viz.—trouserings, coatings, suitings, blankets, velvets, corduroys, plushes, etc. This is followed by advanced work in Jacquard designing and weaving which serves not only to acquaint the student with the many kinds of cotton, woolen, worsted, and silk fabrics of figured designs, but stimulates and develops any artistic talent he may possess. Decorative Art becomes an important part of the work of the second and third years.

The course in general inorganic and organic chemistry of the first year leads to the subjects of textile chemistry and dyeing in the second year. The instruction includes a short course in the dyeing laboratory.

Power weaving commences with the second year and continues throughout the course and work on all types of looms is required.

During the third year the student receives instruction in the finishing of cotton goods and woolen and worsted cloths. This instruction is given by means of lecture and laboratory work.

The engineering subjects given in the second and third years are intended to acquaint the student with such general knowledge as will be of assistance should he be called upon in later life to be a mill manager or should his subsequent progress lead to some executive position in the operation of a textile plant.

For detailed description of the subjects see page 109.

COURSE III-3.—TEXTILE DESIGN

General Textile Course

(For First Term see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mechanism	B-3 45	Elementary Chemistry	C-1 75
Mechanical Drawing	B-8 75	Elementary German or	E-2 } 45
Mathematics	B-1 30	Elementary French	E-4 }
Textile Design	D-1 120	Physical Culture	I-1 30
Cotton Yarns Manufacture	F-1 60	English	E-1 30

SECOND YEAR

FIRST TERM

Textile Design, Decorative		Machine Drawing	B-10 30
Art, Hand Loom Weaving	D-2, 3, 4, 5 173	Steam Engineering	B-12 45
Cotton Yarn Manufacture	F-1 90	Weaving Mechanism	B-5 30
Power Weaving	D-9 67	Physics	B-11 30
Textile Chemistry and Dyeing	C-9 30	Industrial History	E-6 15

SECOND TERM

Textile Design Decorative		Textile Chemistry and Dyeing	C-9, 11 52
Art, Hand Loom Weaving	D-2, 3, 4, 5 187	Physics	B-11 30
Wool Yarn Manufacture	F-1 97	Industrial History	E-6 15
Power Weaving	D-9 129		

THIRD YEAR

FIRST TERM

Textile Design, Cloth Construction, Decorative Art		Power Weaving	D-10 105
	D-6, 7, 8 158	Woolen and Worsted Finishing	H-1 75
Woolen and Worsted Yarn Manufacture	G-1 112	Cotton Finishing	H-2 30

SECOND TERM

Textile Design, Cloth Construction, Decorative Art		Power Weaving	D-10 128
	D-6, 7, 8 135	Woolen and Worsted Finishing	H-1 75
Woolen and Worsted Yarn Manufacture	G-1 112	Cotton Finishing	H-2 60
		Thesis	

COURSE IV-3.—CHEMISTRY AND DYEING

The three year course in chemistry and dyeing is offered to those who are not able to devote four years for the course in chemistry and textile coloring. Many of the same subjects are given in the three year course that are included in the four year course, but it is not possible to cover these to the same extent in three years as in the longer course. The course, however, offers a very satisfactory preparation for those who intend to enter upon any branch of textile coloring, bleaching, or the manufacture or sale of the various dyestuffs and chemicals used in the textile industry. The theory and practice of all branches of dyeing, printing, bleaching, scouring, etc., are taught by lecture work supplemented with a large amount of laboratory work.

During the first year general chemistry, including both inorganic and organic, is taught by lectures and laboratory work, and this is supplemented during the second term by qualitative analysis and stoichiometry.

Advanced inorganic as well as advanced organic chemistry are studied throughout the second year as a continuation of the elementary chemistry of the first year, but the greater part of the time is spent upon quantitative analysis, industrial chemistry and textile chemistry and dyeing.

The third year is devoted to advanced textile chemistry and dyeing, dye testing, dye matching, woolen and worsted finishing, calico printing and cotton finishing, quantitative analysis, industrial chemistry, and physical chemistry.

The work is taken up in a thorough manner and has been so arranged that an equal amount of time is spent in the laboratories and in classroom work. Sufficient studies are taken in the other departments to broaden the knowledge of the student in regard to textile work in general, and he is given such training as the time will permit in mathematics, mechanical drawing, modern languages and designing.

The student who conscientiously performs all of the prescribed laboratory work and the practice work should be proficient not only in dyeing and textile printing, but should be well trained in the methods of analysis and the testing of the various chemicals, mordants and dyestuffs so extensively used in the textile industry.

For detailed description of the subjects see page 109.

COURSE IV-3.—CHEMISTRY AND DYEING

(For First Term see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mechanism	B-3 45	Elementary German or	E-2 } 45
Mechanical Drawing	B-8 30	Elementary French	E-4 }
Mathematics	B-1 30	Physical Culture	I-1 30
Cloth Analysis	D-1 30	Qualitative Analysis	C-21 65
Elementary Chemistry	C-1 75	Stoichiometry	C-3 30
English	E-1 30		

SECOND YEAR

FIRST TERM

Advanced Inorganic Chemistry	C-4 45	Industrial Laboratory	C-12 105
Quantitative Analysis	C-6 150	Steam Engineering	B-12 45
Textile Chemistry and Dyeing	C-9, 10 98	Physics	B-11 30
		Power Weaving	D-9 22
		Industrial History	E-6 15

SECOND TERM

Advanced Inorganic Chemistry	C-4 45	Textile Chemistry and Dyeing	C-9, 10 128
Advanced Organic Chemistry	C-5 45	Physics	B-11 30
Quantitative Analysis	C-6 180	Industrial History	E-6 15
		Industrial Laboratory	C-12 67

THIRD YEAR

FIRST TERM

Quantitative Analysis	C-7 165	Advanced Textile Chemistry and Dyeing	C-14 255
Physical Chemistry	C-8 30	Woolen and Worsted Finishing	H-1 30
Industrial Chemistry	C-13 30		

SECOND TERM

Quantitative Analysis	C-7 127	Engineering Chemistry	C-16 15
Physical Chemistry	C-8 15	Industrial Analysis	C-17 37
Industrial Chemistry	C-13 30	Woolen and Worsted Finishing	H-1 68
Advanced Textile Chemistry and Dyeing	C-14 105	Thesis	C-19 113

COURSE VI-3.—TEXTILE ENGINEERING

This course is planned to train as far as possible in three years the student to meet intelligently the engineering problems of the textile industry, as well as to provide him with the essentials of the processes and machines in the varied branches of this industry. Many of the subjects taken in this course are the same as given in I-4, page 93, but some can not be taken up in the limited time while others can be carried farther in the fourth year.

The student is first thoroughly grounded in the broad fundamental principles of science and mathematics underlying all engineering work and textile manufacturing with its many closely allied industries. The most important of the preliminary subjects are mathematics, physics, mechanics and mechanism, and mechanical drawing. The work in mechanism and drawing is particularly thorough and the practical uses of these subjects are considered of first importance. The study of physics while taking up the usual branches included in this subject also serves to a preparatory course for later instruction in Steam, Electricity and Hydraulics. The student is required to spend a portion of his time during the course upon the subjects of cotton yarns, woolen and worsted yarns, and power weaving with practical work in each branch. During his first year he has a brief course in the elements of design, and in his second year he pursues a course in textile chemistry and dyeing which is preceded in the first year by the necessary preliminary course in elementary organic and inorganic chemistry. Special importance is attached to the study of power generation, transmission, and measurement and courses with laboratory practice are given in the elements of steam, electrical and hydraulic engineering, to familiarize the student with the means, methods and results available in the modern practice of these branches.

The recently equipped engineering laboratory together with the extensive power plant of the school affords opportunities for a varied line of experimental work including boiler, engine, turbine, generator and pump tests. Systematic instruction in the most approved methods of machine shop practice is provided in a shop which is fully equipped with the best makes of modern tools. This feature of the course is considered a most valuable adjunct to the training of a textile engineer.

The work in mill engineering covers a wide range of subjects including mill construction with calculations and drawings, mill heating, lighting, fire protection, and electric driving. The arrangement of plants and machinery for the most economical power distribution and efficient organization is also taken up in detail, data for problems being taken from actual cases and the solutions compared with those of some of our best known mill engineers.

For detailed description of the subjects see page 109.

COURSE VI-3.—TEXTILE ENGINEERING

(For First Year see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mechanism	B-3 45	Elementary German or	E-2 } 45
Mechanical Drawing	B-8 75	Elementary French	E-4 }
Mathematics	B-1 45	Physical Culture	I-1 30
Textile Design	D-1 60	Mechanical Laboratory	B-6 37
Elementary Chemistry	C-1 75	Cotton Yarns	F-1 60
English	E-1 30		

SECOND YEAR

FIRST TERM

Cotton Yarn Manufacture	F-1 90	Weaving Mechanism	B-5 30
Power Weaving	D-9 30	Applied Mechanics	B-4 30
Textile Chemistry and Dye- ing	C-9 30	Machine Shop Practice	B-15 60
Mathematics	B-2 45	Engineering Laboratory	B-14 30
Machine Drawing	B-10 75	Physics	B-11 30
Steam Engineering	B-12 45	Industrial History	E-6 15

SECOND TERM

Woolen and Worsted Yarn Manufacture	G-1 97	Steam Engineering	B-12 30
Power Weaving	D-9 38	Applied Mechanics	B-4 30
Textile Chemistry and Dye- ing	C-9 15	Machine Shop Practice	B-15 60
Mathematics	B-2 45	Engineering Laboratory	B-14 37
Machine Drawing	B-10 90	Physics	B-11 30
		Industrial History	E-6 15

THIRD YEAR

FIRST TERM

Woolen and Worsted Yarn Manufacture	G-1 90	Cotton Finishing	H-2 15
Power Weaving	D-10 45	Machine Shop Practice	B-15 60
Woolen and Worsted Finishing	H-1 30	Engineering Laboratory	B-14 38
Mill Engineering	B-17 120	Electricity	B-20 52
		Mathematics	B-2 45

SECOND TERM

Woolen and Worsted Yarn Manufacture	G-1 90	Electrical Engineering	B-20 53
Woolen and Worsted Finishing	H-1 67	Hydraulics	B-13 30
Cotton Finishing	H-2 15	Machine Shop Practice	B-15 60
Mill Engineering	B-17 105	Engineering Laboratory	B-14 30
		Power Weaving	D-9 45

ENTRANCE REQUIREMENTS

The requirements for admission to this school are given in detail on pages 69-80.

DIPLOMA COURSES—REQUIRED SUBJECTS

- A-1 Plane Geometry
- A-2 Algebra (I Elementary. II Advanced.)
- A-3 Elementary German B
or
- A-4 Elementary French B
- A-5 English
- A-6 History
- A-7 Arithmetic

DEGREE COURSES—REQUIRED SUBJECTS

- A-1 Plane Geometry
- A-2 Algebra (I Elementary. II Advanced.)
- A-3 Elementary German A
or
- A-4 Elementary French A
- A-5 English
- A-6 History

DEGREE COURSES—ELECTIVE SUBJECTS

- A-8 Physics
- A-9 Chemistry
- A-10 Solid Geometry
- A-11 Trigonometry
- A-12 Mechanical Drawing
- A-13 Mechanic Arts
- A-14 English History
- A-15 Advanced German
or
- A-16 Advanced French
- A-17 English

Subjects of Instruction

TEXTILE ENGINEERING DEPARTMENT—B

Mathematics

(Algebra, Trigonometry, Elements of Analytical Geometry)—B-1

PREPARATION: A-I, A-2

This subject is given in the first year with the view of consolidating the separate branches of mathematics that have been given in previous years. The progress of the school has been such as to necessitate the introduction of Higher Algebra and Trigonometry, in the early part of the first term, and hence, as in other technical schools, it has resulted in a combined course. This course is presented by means of lectures, text-book, class and problem work, and consists essentially of the following: Progressions, Graphical Representation, Permutations and Combinations, Logarithms, Slide Rule, Trigonometry, Binomial Theorem, Partial and Continued Fractions, Series, Theory of Equations, Significant Figures, and Plotting of Scientific Data, Straight Line Equations, Point of Division of a Line, Equation of Parallel and Perpendicular Lines.

[ALL COURSES]

Mathematics

Analytical Geometry, Differential Calculus, Elements of Integral Calculus)—B-2

PREPARATION: B-I

This course is a continuation of the work of the first year, and treats of the following subjects: Formulae of Differentiation, Conic Sections, Transformation of Co-ordinates, Maxima and Minima, Direction of Curves, Center and Radius of Curvature, Problems on Differential Calculus, Elements of Integral Calculus, Integration as a Summation, and Plane Areas. The above are treated in both Rectangular and Polar Co-ordinates. Formulae of Integration, Integration by parts, Integration by Substitution, Successive Integration, Evaluation of Integrals, Center of Gravity, Center of Pressure, Total Pressure, Moment of Inertia.

[COURSES I-4, VI-3]

Mechanics and Mechanism—B-3

PREPARATION: A-I, A-2, B-I. TAKEN SIMULTANEOUSLY WITH B-I

These subjects are a necessary preparation for all courses and are taken in one hundred and five hours of lectures and recitations covering the whole of the first year. The fundamental principles of these subjects are considered of the greatest importance and the application and problems are selected with special reference to their practical uses in textile machinery. The large variety of mechanism applications met in textile machines makes this course an essential one as a proper preparation for the student's later work in spinning and weaving. Some of the subjects treated in this course are:

MECHANICS

Work, power and energy.
Principle of moments.
Simple and compound levers.
Differential and common pulleys.
Jack screw and worm and wheel.
Parallelogram and triangle of forces.
Inclined plane and wedge.

MECHANISM

Linear and angular velocity.
Belting calculations.
Gears and gear trains.
Cam and cone pulley design.
Linkage problems.
Intermittent motions.
Differential and epicyclic trains.

[ALL COURSES]

Applied Mechanics—B-4

PREPARATION: B-1 AND B-3

The work in this course is presented by lectures and recitations. First are considered mathematical and graphical conditions for equilibrium for any system of forces and the subjects of center of gravity and funicular polygons are introduced. Then follow problems on bridge and roof trusses under various conditions of dead, live, wind and snow loading. Masonry arches are finally considered. The course also includes a study of moment of inertia, dynamics and strength of materials.

[COURSES I-4, VI-3]

Weaving Mechanism—B-5

PREPARATION: TAKEN SIMULTANEOUSLY WITH D-9

This course consists of thirty lectures given during the first term of the second year and is required by all the regular students taking power weaving. A thorough analysis of all the important motions of power weaving is undertaken and the treatment is by graphical and analytical methods. The object of this course is to so familiarize the student with the theory of the mechanism of the loom that the time spent in the weave room on loom fixing will be used to the best advantage.

[COURSES I-4, I-3, II-3, III-3 AND VI-3]

Mechanical Laboratory—B-6

PREPARATION: B-3. TAKEN SIMULTANEOUSLY WITH B-4

This work is given during the second term of the first year and is supplementary to the course in Mechanism. Especial importance is attached to the demonstration of the fundamental principles of these subjects. Some of the experiments and tests made in this course are as follows:

Determination of coefficient of friction.

Proof of principle of moments.

Proof of principle of work.

Efficiency test of various hoisting and lifting appliances, such as tackle and fall, worm block, differential and triplex blocks, jack screws, wedges, etc.

Experimental proofs of the principles of graphic statics.
Efficiency tests on belt transmissions including measurement of belt tensions, coefficient of friction, slip, etc.
Tests on various types of absorption dynamometers.
Calibration of transmission dynamometer.
Power measurements on textile machinery with differential dynamometer.
Measurement of friction of steam engine.

[COURSES I-4, VI-3]

Mechanical Drawing—B-7

PREPARATION: A-I. TAKEN SIMULTANEOUSLY WITH B-3

This course is taken during the first year, and consists of work in the drawing room supplemented by lectures. This subject is considered of the greatest importance as a preparation for the student's future work and the practical usefulness of drawing of this character is fully emphasized. The course is systematically laid out covering in order the following divisions:

Care and use of drawing instruments.

Geometrical constructions.

Elements of projections and descriptive geometry.

Isometric projection.

Developments with practical applications.

Sketching practice on machine details.

[ALL COURSES]

Machine Drawing—B-8

PREPARATION: B-7

This work is the continuation of the mechanical drawing and is pursued throughout the second term of first year. This work is wholly of a practical character and includes sketching from textile machinery details, working scale detail and assembly drawing, tracing and blue printing. The rudiments of machine design to supplement the work in strength of materials is also given.

[COURSES I-4, I-3, II-3, III-3, VI-3]

Machine Drawing—B-9

PREPARATION: B-7

For students electing IV-2 or II-4 in the second term of the first year a course of machine drawing is given similar to B-8 except that it is not as extensive and is concluded in thirty hours.

Machine Drawing—B-10

PREPARATION: B-3, B-7, B-8

During the second year a period of two hours per week is devoted to advanced graphical mechanism problems. The data for all of these problems is in every case taken directly from some of the textile machines that the students meet in other departments. These problems include cam designs for builder motions, mule scroll layouts, Scaife builder motion analysis, fly frame cone design, mule quadrant motion, analysis of camless winder and a number of others of similar character.

[COURSES I-3, II-3, III-3, I-4]

Physics B—11

PREPARATION: B-1

This course is given during the second year and serves especially as a preparation for Steam Engineering, Hydraulics, Electricity and the Study of Color. The subject is presented by means of lectures, recitations, problems, and reference books. The lectures deal chiefly with the application of the various physical laws and principles with the view of their adaption to the above subjects, while the reference books are used to supplement the lectures. The subjects taken up are essentially as follows: Gravitation, Moving Bodies, Mechanics, Elasticity, Hydrostatics, Elements of Hydraulics, Properties of Fluids and Gases, and the Theory of Sound. These subjects are followed by a series of lectures on heat phenomena dealing with the Generation of Heat, Thermometry, Calorimetry, Transfer of Heat, its Effect on Solids, Liquids, and Gases, and problems such as lead up to the Elements of Steam Engineering.

The latter part of the course is devoted to the discussion of the laws governing the Nature, Propagation and Transmission of Light waves, special stress being laid on interference, reflection and refraction, mirrors, lenses, microscope, spectroscope and photometer. Particular attention is given to the color effects produced by the combination of different colors in connection with Maxwell's Color Diagram and the Young Helmholtz Theory of Color Sensation. During the last part of the course the principles of Electricity and Magnetism are taken up in detail.

[ALL COURSES]

Steam Engineering—B-12

PREPARATION: B-II

The purpose of this work is to familiarize the student with the essentials of power generation and the means and methods of modern practice in steam engineering.

The different types of boilers, engines, pumps, condensers, turbines, and other important features of a steam plant are first considered with reference to their construction and general arrangement. The remainder of the course is devoted to a thorough study of these elements of a power

plant from the standpoint of the heat phenomena upon which their operation and efficient performance depend. Practice with the steam engine indicator is included in this work, and also engine and boiler testing.

[ALL COURSES]

Hydraulics—B-13

PREPARATION: B-3, B-11

This subject is presented by means of lectures covering the principles of hydraulics, including hydrostatics, measurements of flow of water through orifices, pipes, nozzles and over weirs. The different types of turbines are studied with results of tests and rating tables.

[COURSES I-4, VI-3, I-3, II-3]

Engineering Laboratory—B-14

PREPARATION: B-12

The principles underlying the subjects of Steam Engineering, Hydraulics and Thermodynamics are demonstrated in a practical manner in the work in the Engineering Laboratory. Greater importance is attached to the development of initiative and responsibility in the student than the mere accomplishment of a large number of carefully planned tests. The character of this work is indicated by the following list of experiments and tests:

Calibration of gages, thermometers, indicators, anemometers, tachometers, and other measuring instruments.

Experiments on flow of steam.

Calorimeter tests.

Radiation tests and pipe covering tests.

Injector and ejector tests.

Engine tests. Condensing and non-condensing.

Steam pump tests.

Surface condenser tests.

Valve setting.

Boiler testing.

Tests on heating and ventilating fans, both motor and engine driven.

Pump tests. Triplex and centrifugal.

Air compressor tests.

Flue gas analysis.

Steam turbine tests. Condensing, non-condensing and low pressure.

Complete steam plant testing.

Gas engine testing.

[COURSES I-4, VI-3]

Machine Shop Practice—B-15

PREPARATION: B-3

Systematic instruction is given in the most approved methods of machine shop practice, the object being to familiarize the student with the proper use of hand and machine tools and the characteristics of the different materials worked. Arrangements have been made with a local machine company of such a character as to give the work the greatest educational value and the important commercial element which stimulates the student's interest. Particular attention is given to the form, setting, grinding and tempering of tools and the mechanism of the different machines involving certain speeds, feeds, etc. The course is so planned that the instruction in each typical operation shall conform as nearly as possible to commercial machine shop practice on textile machinery. The list of tools which appears under Equipment in this bulletin gives an idea of the scope of the work which includes chipping and filing, tool grinding and tempering, straight and taper turning, screw cutting, drilling and boring, planer work; milling machine work, including gear cutting. Instruction is also given in the use of wood working tools, both hand and machine and in forging.

[COURSES I-4, VI-3]

Mill Engineering—B-17

PREPARATION: B-3, B-4, B-10

This work covers a wide range of subjects and is of the most practical character possible. All of the student's previous work in engineering and his knowledge of the textile processes are here brought together in the consideration of the larger problems of mill design, construction and organization. A detailed study is made of the most modern types of mill buildings including all calculations and drawings. Practice is also given with the engineer's transit and level in plane surveying, setting batters, lining and leveling shafting.

The modern methods of power transmission and the proper arrangement of textile machinery are also given careful consideration. The problems are in every case taken from actual conditions from mills already built or in process of construction. The questions of mill heating, ventilation, lighting, humidification and fire protection are also studied and the time spent in the drawing-room enables the student to work out nearly all of the more important problems involved in the design of an entire textile mill plant. The close relation existing between proper plant design and economical production is also considered.

[COURSE I-4]

Power Plants—B-18

PREPARATION : B-13

This course, which consists of lectures given in the second term of the third year, takes up the fundamental considerations involved in the planning of a power plant for a textile mill. A standard text book is used in connection with the lectures and the problems are taken largely from plans of existing modern plants. The choice of type and size of units for certain conditions are given particular attention.

[COURSES I-4, VI-3]

Physical Laboratory—B-19

PREPARATION : B-II

Laboratory work is given to familiarize the student with physical measurements and to exemplify the principles set forth in the lectures in Physics. Reports are prepared from each experiment giving the object of the experiment, method of procedure, observations and conclusions, in order that the student may acquire practice and understand the interpretation of data. Particular attention is given to physical tests upon textile material.

[COURSE I-4]

Electrical Engineering—B-20

PREPARATION : B-II

The elementary principles of Electricity and Magnetism are considered in a lecture course. The development and application are shown by detailed study of the means used to generate, transmit, and transform electrical energy to meet the requirements of textile machinery and plants. This involves the theory of Direct and Alternating Generators, Motors, Instruments, as well as the various phenomena associated with them.

The laboratory course includes a study of instruments and methods employed in general electrical power testing. Attention is given to various lighting units, their particular properties and relative values in meeting the special problems of illumination in textile mills.

[COURSES I-4, VI-3]

CHEMISTRY AND DYEING DEPARTMENT—C

Elementary Chemistry (Inorganic and Organic Chemistry)—C-1

Instruction in Elementary Chemistry extends through the first year and includes lectures, recitations, and a large amount of individual laboratory work upon the following subjects:

Inorganic Chemistry

Chemical Philosophy

Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, salts, Avogadro's law, molecular weights, formulas, valence, periodic law, etc.

Non-Metallic Elements

Study of their occurrence, properties, preparation, chemical compounds, etc.

Metallic Elements

Study of their occurrence, properties, metallurgy, chemical compounds, etc.

The students take up as thoroughly as the time will permit the qualitative detection of the more common metals and non-metals, with practical work.

Organic Chemistry

The Hydrocarbons and their Derivatives

Study of their occurrence, properties, preparations and uses. This work although elementary in character is of sufficient breadth to prepare the student understandingly for the work with the artificial dyestuffs which follows.

[ALL COURSES]

Qualitative Analysis—C-2

PREPARATION: C-1 TAKEN SIMULTANEOUSLY

Qualitative Analysis is studied during the second term of the first year. The work consists of lectures, recitations, and laboratory work. The student must become familiar with the separations and the detections of the common metals and acids by the analysis of a satisfactory number of solutions, salts, alloys, and pigments. At intervals during the term, short laboratory tests are given as well as the regular written examinations.

No pains are spared to make the course as valuable to the student as possible and to encourage only thorough and intelligent work.

When sufficiently advanced, students take up the examination of various products with which the textile chemist must be familiar, such as testing mordanted cloths, pigments, and the various dyeing reagents.

During the latter part of this course a certain amount of time is devoted to the preliminary operations of Quantitative Analysis, such as the precipitation and washing of such substances as barium sulphate, magnesium ammonium phosphate and calcium oxalate, although no weighings or actual determinations are made.

A student's marks in this subject depend as much upon the neatness and care used in manipulation as upon the actual results obtained.

[COURSES II-4, IV-3]

Stoichiometry—C-3

PREPARATION: B-I

This subject is taken during the second half of the first year. The application of the metric system is thoroughly studied, and problems are worked involving the expansion and contraction of gases, determination of empirical formulae, combining volume of gases and quantitative analysis.

[COURSES II-4, IV-3]

Advanced Inorganic Chemistry—C-4

PREPARATION: C-I

The whole subject of Inorganic Chemistry is reviewed during the second year, and many advanced topics are introduced which were necessarily omitted from the first year course in General Chemistry.

[COURSES II-4, IV-3]

Advanced Organic Chemistry—C-5

PREPARATION: C-I

In this course which consists of lectures and recitations, the principles of organic substitution and synthesis are thoroughly discussed, and as many illustrations are used as the time will permit, particularly such as are applied in the arts. The aliphatic series of hydrocarbons and their derivatives are studied for about twenty weeks, the remainder of the time being devoted to the benzene series. The aim of the course is to lay a broad foundation for the study of the Chemistry of the artificial dyestuffs. Students are required to work out problems in the synthesis of various compounds in order to become familiarized with equation writing.

[COURSES II-4, IV-3]

Quantitative Analysis—C-6

PREPARATION: C-2, C-3

During the second year, the principles of analytical work are thoroughly taught, the work being based on Talbot's Quantitative Chemical Analysis. Gravimetric analysis is studied during the first term, and volumetric analysis during the second term. The samples analyzed include

salts, ores, minerals, bleaching powder and alkalies. Frequent recitations are held for the discussion of methods and the solution of stoichiometrical problems. Students are encouraged to read the standard works and magazines on chemical subjects, in order to cultivate broad views of the science.

[COURSES II-4, IV-3]

Qualitative Analysis—C-7

PREPARATION: C-6

This course consists chiefly of technical analysis, the principal consideration being the analysis of water, alum, ammonia, soaps, coal, indigo, tannin, and the ultimate analysis of organic compounds, as well as the examination of acids, alkalies, oils scouring materials and such substances as starches, gums, and other thickeners, and the detection of adulterants.

No pains are spared to give the student the benefits of all the latest researches along the lines of industrial analytical methods, and original work is encouraged in all.

[COURSES II-4, IV-3]

Physical Chemistry—C-8

PREPARATION: C-4, C-5, B-11

This subject is studied during the third year. It includes the principles of calorimetry, specific heat, vapor density, the various methods of determining molecular weights, laws of solutions, electrolytic dissociation, theories of precipitation, thermo-chemistry, surface tension, etc. The student is required to work out a large number of problems introduced by the subject.

[COURSES II-4, IV-3]

Textile Chemistry and Dyeing—C-9

PREPARATION: C-1, B-3, B-7

The outline of the lecture course which is given through the second year is as follows:

Technology of Vegetable Fibres

Cotton, Linen, Jute, Hemps, China Grass. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies and heat.

Technology of Animal Fibres

Wool, Mohair, Silk. Chemical and physical properties, chemical compositions, microscopical study, and their action with chemicals, acids, alkalies and heat.

Technology of Artificial Fibres

Study of the various forms of artificial silk, the process of manufacture, their properties and action with chemicals, acids and heat.

Operations Preliminary to Dyeing

Bleaching of cotton and linen, wool scouring, bleaching, fulling and felting of wool, carbonizing, silk scouring and bleaching, action of soap.

The bleaching of cotton cloth, yarn and raw stock is studied at length with detailed descriptions of the various forms of kiers and machinery used; also the action of the chemicals used upon the material and the various precautions that must be taken in order to insure successful work.

Under this heading is also included an exhaustive study of the reagents used in emulsive wool scouring process and their action upon the fibre under various conditions; also the most successful of the solvent methods for degreasing wool.

Water and its Application in the Textile Industry

Impurities present, methods for detection, their effect during the different operations of bleaching, scouring, dyeing and printing, and the methods for their removal or correction.

The important subject of boiler waters is also studied under this heading with a full discussion of the formation of boiler scale, its disastrous results and the methods by which it may be prevented.

Mordants and Other Chemical Compounds used in Textile Coloring not Classified as Dyestuffs

Theory of mordants, their chemical properties and the application, aluminum mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannin materials, soluble oil, fixing agents, levelling agents, assistants, and numerous other compounds, not dyestuffs, that are extensively used in the textile industry.

Under the heading are included the definitions of various terms and classes of compounds used by textile colorists, such as color lakes, pigments, fixing agents, developing agents, mordanting assistants, mordanting principles and levelling agents.

Theory of Dyeing

A discussion of the chemical, mechanical, solution and absorption theories, and the various views that have been advanced by different investigators of the chemistry and physics of textile coloring processes.

Under this heading are discussed the general methods of classifying dyestuffs and definitions of such terms as textile coloring, dyeing textile printing, substantive and adjective dyestuffs, monogenetic and polygenetic dyestuffs.

Natural Organic Coloring Matters

Properties and application of indigo, logwood, catechu or cutch, Brazil wood, cochineal, fustic, tumeric, madder, quercitron bark, Persian berries, and other natural dyestuffs that have been used within recent years by textile colorists.

Mineral Coloring Matters

Under this heading are discussed the properties of such inorganic coloring matters and pigments as chrome yellow, orange and green, Prussian blue, manganese brown, and iron buff.

Artificial Coloring Matters

General discussion of their history, nature, source, methods of manufacture, methods of classification, and their application to all fibres.

Special study of:—

Basic Coloring Matters.

Phthalic Anhydride Colors, including the eosins and phloxines.

Acid Dyestuffs.

Janus Colors.

Direct Cotton Colors.

Sulphur Colors.

Mordant Colors, including the alizarines and other artificial coloring matters requiring metallic mordants.

Mordant Acid Colors.

Insoluble Azo Colors, developed on the fibre.

Reduction Vat Colors, including Artificial Indigo, Indanthrene, Flavanthrene, Virilanthrene and Melanthrene.

Aniline Black and other artificial dyestuffs not coming under the above heads.

As each class of dyestuffs is taken up, the details of the methods of applying them upon all the different classes of fabrics and in all the different forms of dyeing machines are thoroughly discussed; also the difficulties which may arise in their application, and the methods adopted for overcoming them.

Machinery used in Dyeing

A certain amount of time is devoted to the description of the machinery used in the various processes of textile coloring, which is supplemented as far as possible by the use of charts, diagrams, and lantern slides.

Most of the important types of dyeing machines are installed within the dyehouse of the School and the students can be taken directly from the lecture room and shown the machines in actual operation.

[ALL COURSES]

Dyeing Laboratory—C-10

PREPARATION: C-9 TAKEN SIMULTANEOUSLY

Besides lectures and recitations upon the subject of Textile Chemistry and Dyeing practical laboratory work is required. By the performance of careful and systematic experiments the student learns the nature of the various dyestuffs and mordants, their coloring properties, their action under various circumstances and the conditions under which they give the best results. The more representative dyestuffs of each class are applied to cotton, wool and silk, and each student is obliged to enter in an especially arranged sample book, a specimen of each of his dye trials with full particulars as to the conditions of experiment, percentage of compounds used, time, temperature of dye bath, etc.

For convenience and economy most of the dye trials are made upon small skeins or swatches of the required material, but from time to time students are required to dye larger quantities, in the full sized dyeing machines which are described elsewhere.

By the use of a small printing machine the principles of calico printing are illustrated, and by means of the full sized dyeing machines and vats, the practical side of the subject is studied. It is the constant endeavor of those in charge, to impart information of a theoretical and scientific character that will be of value in the operation of a dyehouse.

[COURSES II-4, IV-3]

Dyeing Laboratory—C-11

PREPARATION: C-9. TAKEN SIMULTANEOUSLY

This course in general laboratory work in Textile Chemistry and Dyeing is given during the second term of the second year. It is so arranged as to acquaint the student with the properties of the fibres, mordants and coloring matters, and their application in the Textile Industry.

[COURSES I-3, II-3, III-3]

Industrial Chemistry Laboratory—C-12

PREPARATION: C-I

Special attention has been given to this subject because it is considered extremely important in the study of chemistry in general, and of textile chemistry in particular. During the second year considerable time is spent in the laboratory in the actual manufacture, from raw materials, of the chemical compounds used in textile work. Each student is required to make careful record of all of the crude materials used, as starting points, and to carry the various processes through carefully with the view of producing as great and pure a yield of each substance as possible. Industrial Chemistry not only involves the appli-

cation of the principles of both inorganic and organic chemistry, but of analytical work as well, for the purity of the compounds produced must be tested after their manufacture.

In addition to the general work in this subject, each student is required to make a special study of the manufacture of some chemical from raw materials in considerable quantity (20 to 25 pounds) making a complete quantitative analysis of all the raw materials used and of the finished product, accounting for everything throughout the process with the object of producing as near the theoretical yield as possible. The student is charged with the amount of raw material at market prices, and the finished product is bought back by the school.

Recently much new apparatus has been added to the industrial chemistry laboratory, and it is now believed to be one of the most complete of its kind. The present equipment allows a comparatively large quantity of material to be handled at one time.

[COURSES II-4, IV-3]

Industrial Chemistry Lecture—C-13

PREPARATION: C-4, C-5, C-12

During the whole of the third year, lectures and recitations are held in Industrial Chemistry, the course in general following "Thorpe's Outline of Industrial Chemistry." Particular attention is paid to those subjects which are of special interest to the textile chemist, as oils, soaps, gas and coal tar industry, building materials, and the manufacture on a large scale of important chemical compounds, such as the common acids and alkalies, bleaching powder, various mordants, etc. The course is illustrated as far as possible with specimens, diagrams and charts, and the students are given an opportunity to visit some of the industrial establishments in the vicinity of Lowell and Boston.

[COURSES II-4, IV-3]

Advanced Textile Chemistry and Dyeing—C-14

PREPARATION: C-9, C-10

This is a continuation of the Textile Chemistry and Dyeing of the second year and includes a review of the second year's work in this subject, with the introduction of many advanced considerations, and in addition the following subjects:—

Classification and Construction of Artificial Dyestuffs

A study from a more advanced standpoint of the classification and constitution of artificial dyestuffs, including the various methods used in their production, also the orientation of the various groups which are characteristic of these compounds, and their effect on the tinctorial power of dyestuffs.

The object of this study is to give the student a more complete knowledge of the artificial dyestuffs from the color manufacturer's point of view, which will prove of particular value to those who intend later to enter the employ of dyestuff manufacturers or dealers.

Color Matching and Color Combining

A study of that portion of physics which deals with color, and the many color phenomena of interest to the textile colorist, the lecture work being supplemented with the practical application of the spectroscope and tintometer, and much practice in the matching of dyed samples of textile material.

The primary colors both of the scientist and textile colorist and the results of combining colored lights and pigments, and such subjects as color perception, color contrast, purity of color, luminosity, hue, color blindness, dichroism, fluorescence, and the effect of different kinds upon dyed fabrics are discussed under this heading.

Each student's eyes are tested for color blindness early in the course in order that he may be given an opportunity to change his course if his eyes should prove defective enough to interfere with his work as a textile colorist.

A dark room has been provided where various experiments in color-work and color matching may be performed.

Dye Testing

This subject includes the testing of several dyestuffs of each class, to all the common color destroying agencies, the determination of their characteristic properties and their action towards the different fibres, also the determination of the actual money value and coloring power of dyestuffs in terms of a known standard.

Each student is required to make a record of each color tested upon an especially prepared card which furnishes a permanent record of all dyestuffs, their dyeing properties, fastness to light and weather, washing, soaping, fulling, perspiration, bleaching, steaming, ironing, rubbing, acids and alkalies.

Union Dyeing

A study of the principles involved in the dyeing of cotton and wool, cotton and silk, and silk and wool union materials with the production of solid and two color effects.

Textile Printing

A thorough study of the whole subject of textile printing, each student being required to individually produce no less than twenty different prints including the following styles:—Pigment style,

direct printing style, steam style with tanning mordant, steam style with metallic mordant, madder or dyed style, the ingrain or developed azo style, discharge dyed style, discharge mordanted style, resist style, indigo printing, aniline black printing.

The different parts of the calico printing machine are thoroughly studied, also the precautions which must be considered in its use and the arrangement of the dyeing apparatus which must accompany such a machine.

Special attention is paid to the methods of mixing and preparing the various color printing plates that are used in the above work upon the manufacturing scale as well as experimentally in the laboratory.

Cotton Finishing

A study of the various processes of finishing cotton cloth and the different materials used therein. The work involves the discussion of the various objects of cotton finishing and such operations as pasting, damping, calendering, stretching, stiffening and filling, and the various machines used for carrying out these processes.

Mill Visits

During the third year, visits are made to some of the large dyehouses, bleacheries and printworks in the vicinity.

[COURSES II-4, IV-3]

Organic Chemistry Laboratory—C-15

The organic Laboratory work includes the preparation of many organic chemicals, the determination of the various constants which establish their purity and a thorough training in organic, analytical and manipulative methods. Several coal-tar dyes are prepared from raw materials obtained by the distillation of coal-tar.

[COURSE II-4]

Engineering Chemistry—C-16

PREPARATIONS C-4, C-5, C-6

A series of lectures is given upon the general subject of Engineering Chemistry, which include particularly the consideration of fuels, oils, and water from the chemical engineer's standpoint. The elements of Chemical Engineering are also considered to such an extent as time will permit.

[COURSES II-4, IV-3]

Industrial Analysis—C-17

PREPARATION: C-6

In conjunction with the lectures in Engineering Chemistry there is required a specified amount of laboratory work in the Industrial Analysis Laboratory which has been recently thoroughly equipped with the latest and best apparatus for fuel and oil analysis.

[COURSES II-4, IV-3]

Microscopy and Photomicrography—C-18

The value of the microscope in the detection and examination of the various fibres cannot be overestimated, and often facts may be discovered, and conclusions drawn, which could be arrived at in no other way.

The students in this course are given as much work with the microscope as time will permit. They receive instruction in the use of the high grade microscopes, and not only have practice in the examination and detection of the fibres, but are required to become proficient in the preparation of permanent slides.

Opportunity is also given for students to take photomicrographs of fibres and the various slides which they may prepare. A special dark room has been provided for this purpose.

[COURSES II-4, IV-3]

Thesis—C-19

Before graduation the student must present a thesis which shall consist of a report of some original investigation or research that he has conducted while at the school.

A certain number of hours are specially set aside for this work, and students are encouraged to select some object for their investigation which shall be of practical as well as theoretical interest.

[COURSE II-4]

Advanced Organic Chemistry (Dyestuffs)—C-20

This course consists of an advanced study of the coal-tar coloring matters, their chemistry, relations of their composition to their coloring power, and the chemistry of their preparation.

[COURSE II-4]

Technical German—C-21

This course consists of the reading of German technical journals with the object of familiarizing the student with the current German publications in Textile Chemistry and Coloring.

[COURSE II-4]

TEXTILE DESIGN AND WEAVING DEPARTMENT—D

Textile Design—D-1

During the first year instruction is given in the subjects of classification of fabrics, use of point or design paper, plain fabrics, intersection, twills and their derivation, sateen, basket and rib weaves, checks and stripes, fancy weaves including figured and colored effects; producing chain and draw from design and vice versa; extending and extracting weaves.

[FIRST TERM—ALL COURSES]

[SECOND TERM—COURSES I-4, I-3, II-3, III-3, VI-3]

Decorative Art—D-1

The instruction in this subject is given in connection with Textile Design, and is conducted entirely by class work. During the first term Freehand Drawing is taught by means of plates and models, and practice in coloring is given in conjunction with this work.

Practice in lettering, spacing and general arrangement of designs and sketches is given. The Engineering alphabet is used in all work.

During the second term instruction is given in drawing, sketching, coloring and designing with reference to their application in textiles. Good examples of applied design in textiles as well as in other branches are used as a basis for modified designs selected and composed by the student. This stimulates originality as well as teaches the student to appreciate good designs and color.

Cloth Analysis—D-1

In the first year this subject takes up in a systematic manner the analysis of samples illustrating the various cloth constructions for the purpose of determining the design of the weave, the amount and kind of yarns used and forms the basis of calculation in the cost of reproducing any style of goods. The various topics discussed are: reeds and setts; relation and determination of counts of cotton, woolen, worsted, silk, and yarns made from the great variety of vegetable fibres; grading of yarns, folded, ply, novelty and fancy yarns; application of the metric system to yarn calculation; problems involving take-up, average counts, determination of counts of yarn, weight of yarn required to produce a given fabric.

[FIRST YEAR—ALL COURSES]

Hand Loom Weaving—D-1

During the first year the work in hand loom weaving is taken in connection with design and analysis and consists largely of picking-out

patterns and reproducing them in the loom. Instruction is also given in hand dressing, combing, beaming, drawing-in and building harness chains for dobby work.

[FIRST TERM—ALL COURSES]

[SECOND TERM—COURSES I-3, II-3, III-3]

Textile Design—D-2

FOR COTTON GOODS—PREPARATION: D-I

The work of the second year follows with consideration of fancy and reverse twills, diaper work, damasks, skip weaves, sateen fabrics with plain ground, backed fabrics, and multiple ply fabrics. Students are required to make original designs and put the same into the loom. Special attention is given to the consideration of color effects.

The analysis of these fabrics forms a part of the course in design. This also includes the necessary calculations required to reproduce the fabric or to construct fabrics of similar character.

[COURSES I-4, I-3, III-3]

Textile Design—D-3

FOR WOOLEN AND WORSTED GOODS

PREPARATION: D-I

During the second year the instruction given includes warp and filling backed cloths, figured effects produced by extra warp and filling, double cloths, multiple ply fabrics, cotton warps, blankets, bath-robcs, crepes, filling reversibles, Bedford cords, imitation furs, crepons, matelasse and imitations, double plain, ingrains, velvets, corduroys, overcoatings, trouserings.

The analysis of these fabrics together with the consideration of the shrinkages, and dead loss in all fabrics, theory of diameter of yarns, costs of mixer and blends, is a part of this course.

[COURSES I-4, II-3, III-3]

Decorative Art—D-4

PREPARATION: D-I

The work of the second year is similar to that of the previous year, but is more advanced and specific. More original work is required as well as copying and composition work.

[COURSE III-3]

Hand Loom Weaving—D-5

PREPARATION: D-1

In the second year, blanket, Jacquard and leno work are covered, and experiments are made with different weaves and fabrics.

[COURSE III-3]

Textile Design—D-6

PREPARATION: D-2 OR D-3

The advanced work takes up the more complicated weaves adapted to harness work and leads into leno and Jacquard designs. The following is a brief list of the subject heads which will give some idea of the course: Double plain cloths, ingrains, tricots, chinchilla, tapestry, blankets, upholstery, spot weaves, pile or plush, crepon, matelasse and its imitation, pique, Marseilles, quilting, miscellaneous designs for Jacquard, lenos, fustian, tissue fabrics and lappets.

The same plan is pursued during this year as in the second year; that of requiring the student to make original designs and to weave the same.

[COURSES I-4, I-3, II-3, III-3]

Cloth Construction—D-7

PREPARATION: D-2 OR D-3

The work includes the application of the different weaves and their combinations in the production of fancy designs, both modified and original, the calculations involved in the reproduction of standard fabrics changed to meet varying conditions of weight, stock, counts of yarn and value, and the discussion of the breaking strengths of fabrics and relationship of the construction of the fabric to breaking strength.

Instruction in this subject which is given by class room work, is intended to bring together the principles considered under the subjects of design, cloth construction, weaving and yarn making of previous years, and to show the bearing each has in the successful construction of a fabric.

[COURSE I-4, I-3, II-3, III-3]

Decorative Art—D-8

PREPARATION: D-4

Original designs and sketches for particular grades of goods and the study of color effects form the important part of the third year course. It should be understood that work in Decorative Art is carried on in conjunction with textile construction and weaving, particularly on the Jacquard loom. Designs of merit are carefully developed in detail and woven into cloth.

[COURSE III-3]

Decorative Art for Special Students

This course is planned to give a student a working knowledge and appreciation of design. The first and second years are devoted to a general study of design, color, perspective, lettering and rendering. Drawings are made in the Historic styles for all materials—wood, gold, silver, copper, brass, leather, fabrics, wall papers, and glass.

In the third year students should specialize and devote their attention to the material in which they expect to work.

Power Weaving—D-9

PREPARATION: D-I. TAKEN SIMULTANEOUSLY WITH B-5

In connection with the work in Textile Design and Cloth Analysis practical work is carried on upon the power looms. This includes the preparation of warps, beaming, dressing, sizing, drawing-in and making of chains, the cutting and lacing of cards, spooling and quilling and the machinery for the same. A study is made of warpers and sizing machines both for cotton and woolen. Lectures are given to correspond with the progress of the student in the Power Weaving laboratory covering the following subjects:

Loom adjustments, chain building, shuttle changing looms, dobby looms, single and double acting dobbies, handkerchief motions, leno weaving, centre selvedge motions, filling changing looms, oscillating reeds, lappet motions, various shaker motions, towel and other pile cloth weaving, Jacquard looms, single and double lift leno Jacquards, Jacquards of special design, tying up Jacquard harness. The consideration of the mechanical operation and design of the special mechanisms and the calculations involved are taken up by the Engineering Department in the course of weaving mechanism.

[COURSES I-4, I-3, II-3, III-3, VI-3]

Power Weaving—D-10

PREPARATION: D-9; D-2 OR D-3

Instruction is given in weaving on fancy woolen and worsted looms, single and double acting dobbies, leno weaving, various shaker motions, lappet loom weaving, double and single lift Jacquard looms, tying up Jacquard harness, leno Jacquard, harness and box chain building; warp preparation for woolen and worsted and cotton; formulas for making up different kinds of sizing. Lectures are given to correspond with the same.

[COURSES I-4, I-3, II-3, III-3, VI-3]

LANGUAGE AND HISTORY DEPARTMENT—E

English—E-1

PREPARATION: A-5

A technically trained man should be able to express himself clearly, forcibly and fluently, as inability to do so will be a serious handicap to him in after life. The object of the English course is to develop the student's power of expression by a thorough study of the principles of advanced rhetoric and composition and by constant writing of themes illustrative of the four forms of discourse, viz., description, narration, exposition, and argumentation. In addition to the study of rhetoric and composition and the writing of themes, several classics such as are not read in the preparatory schools are studied and discussed.

[ALL COURSES]

Elementary German—E-2

This course is intended for first year students who offer French as an entrance requirement. The work is elementary in character, and much time is devoted to the study of the rudiments of German grammar with practice in composition. During the latter part of the year considerable attention is given to the reading of ordinary German prose, with frequent practice in reading at sight works along scientific and industrial lines.

Advanced German—E-3

PREPARATION: E-2

For students who are pursuing a degree course the elementary course of the first year is continued throughout the second year. The work consists of the reading of scientific German dealing with a variety of subjects, and the translation of commercial German.

[COURSES I-4, II-4]

Elementary French—E-4

This course is intended for first year students who offer German as an entrance requirement. The work is elementary in character, and much time is devoted to the study of grammar and composition. Facility in translation is acquired by a considerable amount of reading from scientific articles.

Advanced French—E-5

PREPARATION: E-4

For students who are pursuing a degree course the elementary course of the first year is continued throughout the second year, and the work is devoted almost entirely to the translation of scientific French.

[COURSES I-4, II-4]

Industrial History—E-6

PREPARATION: A-6

The economic history of a nation is not less interesting or dramatic than its political history, while it is absolutely essential to a thorough understanding of modern business conditions. The object of this course, which is intended for second year students, is to trace the development of the three leading industrial nations of the world, viz., the United States, England, and Germany, from simple, isolated agricultural communities to the complex industrial and commercial society of today. The course consists of weekly lectures supplemented by text-book reading. Among the topics treated are: natural resources; colonization; territorial expansion; manufactures; agriculture; finance; commerce; transportation; revenue tariffs; monopolies; governmental regulation; organization of labor; industrial legislation; immigration, conservation; contemporary problems. During the year each student will be required to write two or more theses on subjects connected with industrial history, in order that he may have practice in research work and also may continue his training in English.

[ALL COURSES]

Economics—E-7

PREPARATION: E-6

This course consists of lectures supplemented by recitations based upon both the lectures and a text book. The character of the course is descriptive rather than theoretical, and the aim is to acquaint the student with the accepted principles of economics and some of their applications to industrial conditions.

Business Administration—E-8

This course covers instruction given under the heading of Business Law, Accounting, Banking, and Efficiency Engineering. These various branches are taken up by means of lectures and text books, and have for an object the acquaintance of the student with business methods and systems in order that he may enter the industry with some knowledge of commercial practice as well as technical processes of manufacturing.

Under the head of Efficiency Engineering the various systems and principles now used to promote efficiency and aid business management are considered with reference to their specific application in the industry.

There are already many examples of successful applications of these principles and these will be available for study.

It is proposed to supplement the work by courses of lectures given by recognized experts in the several branches stated above.

COTTON DEPARTMENT—F

Cotton Yarn Manufacturing—F-1

PREPARATION: B-1, B-3, B-7

Instruction is given by means of lecture and laboratory work. The outline of the course is as follows:

Cotton Fibre

- Development of Cotton Spinning Machinery.
- Botanical Varieties—Their Classification and Characteristics.
- Commercial Varieties—Classifications, Characteristics and Adaptatives.
- Microscopical Examination of Various Cottons.
- Points Considered in Judging Cotton—Dampness, Color, Uniformity, etc.
- Grading and Stapling —**American, Egyptian** and Sea Island Cottons.
- Methods of Cultivation and Marketing.
- Ginning—Construction, Operation and Advantages of Saw and Roller Gins.
- Baling—Various forms of Baling Presses and their Products, Characteristics of each.
- Mixing—Object and Methods of Mixing for Per cent., Grade, Variety and Color Mixtures.
- Classification of the Processes of the Yarn Manufacture.

Opening and Picking

- Construction and Operation of various machines used in opening and picking cotton, Hopper Bale Breaker, Opener, Automatic Feeder, Breaker, Intermediate and Finisher Pickers, Waste Openers and Cleaning Machines.
- Details of Construction—Cleaning Trunks, Evener Motions, Types of Beaters, Grids and Screens, Lap Measuring Motion, Safety Stop Motion.
- Details of Operation—Regulation of the Air Current, Character and Regulation of the Waste, Drafts of Intermediate and Finisher.
- Adjustment of Feeder, Grid Bars, Lap Racks and Feed Rolls.
- Causes of and Remedies for—Uneven laps, Split laps, Ragged selvages, Dirty laps.
- Cleaning and Oiling.

Carding

- Object and Principles of Carding.
- Construction and Operation of Revolving Flat, Wellman, Foss & Peevey and Roller and Clearer Cards.
- Details of Construction—Feed Plate and Rolls, Screens, Flats, Doffer, Combs, Coiler, Mote-knife, etc.

Card Clothing—Various forms of Foundation, Wire, Method of setting, Number of Points per square foot, Shape and Size of Wire, Method of Grinding, Method of Cutting Tape and Clothing Cylinder, Doffer and Flats.

Details of Operation—Method of driving various parts, Stripping, Grinding and Burnishing, Setting of various parts, Draft, Speeds and Production, Temperature and Humidity.

Care of Carding Machinery, defects in quality of work and remedies for same.

Character and Regulation of waste.

Sample Carding by hand of at least twelve different blends.

Drawing

Theory of Drawing.

Effect of the Doublings.

Construction and Operation of the Drawing Frame.

Details of Stop Motions, Mechanical and Electrical and advantages of each.

Details of Drawing Rolls, Solid and Shell, Common and Metallic.

Metallic Rolls—Construction, Operation and Advantages.

Roll Covering—Materials used, Roller Cloth, Selection of leather for various kinds of work, methods of applying leather covering.

Roller Varnish—Its object and methods of applying, recipes for same.

Roll weighing for Common and Metallic Rolls.

Setting of Drawing Rolls for Long and Short Staple, Heavy and Light Slivers, etc.

Minor Details—Clearers, Traverse Motion, Weight Relieving Motion, Trumpets and Condensing.

Amount and proportioning of drafts and tension.

Construction and Operation of Railway Head.

Details of Evener Motion, Stop Motions, etc.

Care of Drawing Machinery, Roller Scouring, Cleansing and Oiling, Sizing of sliver, cut sliver and remedies for same.

Roving Processes

Reeling, Weighing and Numbering of Roving by English and Metric Systems.

The Development of the Fly Frame.

Details of Construction of Slubber, Intermediate, Fine and Jack Fly Frames.

Details of the regulation of Draft, Twist, Lay and Tension on fly frames.

Amount of Twist for various cottons and methods of obtaining same.

Builder Motions—English and American types and method of setting and adjusting.

Proportioning and amounts of draft and roller setting.

Creeling, Piercing, Doffing, Cleaning and Oiling.
Stop Motions—Full bobbin. Safety stop, Back Stop motion, Single Roving Stop Motion.
Details of Winding and Regulation of the Tension.
Study of the Differential Motion and its work in the Fly Frame.
Study of the Functions and Development of the Fly Frame Cones.
Defects in adjustment and product of roving machinery and remedies for same.

Ring Spinning and Twisting

Theory of Spinning.
Classification of yarns in regard to uses, materials, varieties and twist.
Reeling, Weighing and Numbering of single and ply yarns.
Construction and Operation of the Ring Frame.
Consideration of Spinning details, thread guides, separators, traveller cleaners, warp and filling bobbins, space of spindles, drum and bands, roving traverse, etc.
Rolls and roll setting, weighting, single and double boss, amount and proportioning of draft for various yarns.
Twist and twist gearing, Amounts for warp, filling and hosiery yarns, ply yarns, etc.
Rings and Travellers, kinds and methods of determining correct size for various yarns.
Comparison of Single and Double Roving in Spinning.
A Study of the development of the modern Spindle.
The Spinning Builder—Study of the Warp Filling and Combination Builder Mechanisms.
Calculations for Speed, Draft, Twist, etc.
Methods of preparing yarn for Twisting.
The Spooler and Multiple Winder.
Operation of Ring and Flyer Twisters.
A Study of the Wet and Dry Twisting Processes.
Care of the rolls, spindles, bands, doffing.
Uneven, cut and cockled yarns and remedies for same.

Mule Spinning

A Comparison of Throstle, Ring and Mule Spinning and the Products of each machine.
Advantages and Disadvantages of each machine.
Construction and Operation of the Self-acting Mule.
Details of Operation, Drawing and Twisting, Backing off, Winding, Re-engaging.
Details of Construction, Builder Motion, Quadrant, Roller Motion, Nosing Motions, Jacking Motions.
A Study of Building and Winding.

Calculation of Draft, Twist, Drag, Production.

Causes of and remedies for Kinky yarn, Soft cops, Ridgy cops, Uneven chase.

Combing

Object of combing.

Kinds of cotton combed and class of goods requiring combed yarns.

Preparing cotton for Combing, Drawing frame, Sliver lapper, Ribbon Machine.

Combinations of preparatory machine and details of operation.

A study of the Heilmann Comber and its operation, Feed Motion, Nippers, Cylinders, Detaching Mechanisms, Draw-box, Draft, Waste and Production, Single and Double Nip Machines.

Setting and Timing the Comber, Regulation of Waste and Production, Weight of lap, etc.

A Study of the Alsation Comber and its Operation.

A Study of the Nasmith Comber and its operation.

Care and management of combing Machinery.

Organization

Methods of handling Cotton Waste, Details of the manufacture of Cotton Wadding and other Waste Products.

Details of Fine Yarn Spinning, the manufacture of Sewing Thread, Lace Yarns, Twines and Cords.

The Manufacture of Fancy Yarns, Nub, Soop, Splash, Spiral Yarns, Flake Yarns.

Factory Organization for various sizes and styles of yarns, Equipment, Programs, Balance of Production, Cost of Machinery, Power.

The Economic Arrangement of Cotton Machinery.

Life of Cotton Machinery, Depreciation and Valuations.

Factory Cost Systems, Inventory, Productive and Non-Productive Labor, Supplies, Maintenance, General Expense.

[COURSES I-4, I-3, III-3, VI-3]

Knitting—F-2

PREPARATION: F-I OR G-I

The course in Knitting is designed to meet the needs of those requiring special work in this branch, as well as those desiring only a general knowledge of the subject and is taken in the third year. The course begins with lectures upon the yarns used and the preliminary operations, and continues with the construction and operation of the various makes of knitting machines as applied to circular and flat knitting.

Beginning with the hand stocking frame, the student is given instruction upon the machines used for hosiery and the flat machines used in the manufacture of gloves, sweaters and jackets.

Following is a list of subjects taken up:

- Knitting yarns and their Manufacture.
- Operations preliminary to Knitting.
- Winding—Cone Winding, the Payne Winder.
- Development of Knitting.
- Knitting Needles—Their Construction and Operation.
- Latch Needles, Spring Needles.
- Method of Producing Standard Stitches.
- Study of the Plain, Rib and Tuck Stitches and their uses.
- Circular and Flat Knitting Machines.
- Operations involved in the Manufacture of Seamless Hosiery.
- Study of the production of the Rib Top.
- Details of Construction and Operation of the Circular Rib Knitting Machine, including a consideration of Stop Motions, Needle Cams, Pattern Wheels, Splicing Attachments, Measuring Devices.
- Transferring of Rib Tops.
- Details of Construction and Operation of the Seamless Hosiery machine, including a study of Stop Motions, Plating Attachments, Pattern Wheels and Chains, Shaping the Heel and Toe, Reinforcing the Heel and Toe, Loosening the Stitch for Reinforcing and Shaping, Semi, Three-quarter and Full Automatic Hosiery Machines.
- Construction of the Looper and Study of its Operation. Regulation of Tension.
- Designing on Seamless Hosiery Machines—Study of the Production of Fancy Stitches, Designing by means of Colored Threads.
- Size of Yarn for Various Work and Gauges.
- Study of the Finishing of Hosiery—Washing, Dyeing, Boarding, Mending, Pressing, Pairing, Stamping.
- Imperfections in Circular Knit Goods and Remedies for the Same—Dropped Stitches, Curled Work, Ragged Edges, Stains, Streaked Work.
- A Study of the Flat Knitting Machines—The Lamb Principle as applied to Glove and Sweater Manufacture.
- The Jacquard as applied to Flat Knitting Machinery.
- Details of Construction and Operation of Circular Spring Needle Machine—including stitch regulation, adjustment of feeds, take up.
- Tuck Designing on Spring Needle Circular Machines with illustrations.
- Efficiency of Underwear Machines, Production, in yards, pounds and garments.
- Methods of Manufacturing Sweaters, Vests, Scarfs, Mufflers, Caps, etc.
- Method of Manufacturing of Underwear, Union Suits and Two Piece Goods.

[COURSES I-3, II-3]

WOOLEN AND WORSTED DEPARTMENT—G

Woolen and Worsted Yarn Manufacturing—G-1

PREPARATION: B-1, B-3, B-7

Instruction is given by means of lecture and laboratory work, the outline of which is as follows:

Raw Materials

Animal Fibres—Wool, Silk, Mohair, Alpaca, Vicuna, Cashmere, Camel's Hair, etc.

Vegetable Fibres—Cotton, Flax, Hemp, Jute, Ramie.

Wool Substitutes—Noil, Shoddy, Mungo, Extracts.

Waste products manufactured on Woolen Machinery—Cotton Waste, Linters, Flax, Hemp, and Jute Waste.

Sources of supply and relative values of the above.

Chemical and Physical properties and Composition.

Microscopical examination.

Wool Fibre

Physical and chemical structure—Differences between wool, hair and fur.

Physical properties, Strength, Elasticity, Curl, Lustre, etc.

Felting Property—Hygroscopic Property.

Structure and Cause of Kemps.

Definitions of trade terms—Picklock, XXX, XX, 1-2 Blood, 3-8 Blood, 1-4 Blood, Delaine, Braid, etc.

Pulled Wools—Their uses and Classification.

Wool Sorting

Difference between Sorting and Grading—Sorting and Blending.

Judging Spinning Qualities.

Estimating Shrinkage.

Definitions of trade terms—Cots, Hog, Shurled Hogget, Wether, Fribs, Paint, Stain, Shoulder, Cast, etc.

Wool Scouring

Object of Wool Scouring.

Composition of Yolk and Suint.

Cholesterol and Lanolin.

Materials used as detergents.

Emulsion Process—Use of Soda, Potash, Hard and Soft Soaps.

Manufacture of Scouring Soaps with tests for impurities.

Water in Wool Scouring with tests for hardness, etc.

Effect of heat on Wool Fibre with proper heat of scouring liquor.

Recovery of potash salts and wool fat from waste scouring liquor.

The Solvent process—Degreasing Wool with Naphtha.

Construction and use of Scouring Machines and Rinse Boxes with Speeds, Adjustment and Productions.

Construction and use of Dryers, Table and Artificial.
Effect of heat on Lustre; proper heat for various classes of Wool—
Braid, Botany, Mohair, etc.

Carbonizing

Object of Carbonizing.
Carbonizing Wool, Noils, Burr Waste, Rags.
Carbonizing Agents—Sulphuric Acid, Aluminum, Chloride.
Hydrometers.
Strength of Carbonizing Agents.
Carbonizing with Acid Gases.
Neutralizing.

Burr Picking

Object of Burr Picking—the Wools that are Burr Picked, and the reason that they are not carbonized.
Construction and Use of the several Kinds of Burr Pickers.
Adjustments, Speeds and Production of the same.

Mixing and Oiling

Object of Mixing. Laying down lots.
Mixing Different colors of Wool.
Mixing Wool with Cotton, Shoddy, Noils.
Object of Oiling—Discussion of Various Kinds of Oils used.
Oil Testing, Viscosity, Flashing Point.
Manufacture of Emulsions.
Construction and Use of Automatic Oilers, Feeds and Pickers.
Speeds, Productions and Calculations for cost of lots when materials of different values are used.

Carding

Principles of Carding.
Functions of various parts—Feed Rolls, Lickerin, Tumblers, Workers, Strippers, Cylinders, Fancies, Dickies, Doffers.
Construction of various parts.
Direction of Revolution and Speeds.
Card Clothing—Construction and uses of the various Kinds of Backing: Leather, Flexifort, etc.; the several kinds of Wire—Garrett, Metallic, Convex, Lickerin, etc.
The "Counts and Crown" method of counting Card Clothing.
Card Adjusting and the use of Card Sets.
Clothing the Card.
Card Grinding and Grinders, Solid Roll, Traverse, Screw and Chain.

Woolen Cards

Construction and use of the First Breaker, Second Breaker and Finisher.

Various methods of coupling Cards.

Card with Breast.

Woolen Card Feeds—Objects, Construction, and use of Automatic Feeds for First Breaker, Bramwell, etc.

The Construction and use of the several kinds of Automatic Feeds for Second Breaker and Finisher, Apperly, Torrance, Balling Head and Creel, Bates, Kemp, Scotch, etc.

Condensers, Rub Roll, Combination, Double Apron.

Calculations for Proper Weight of Rovings, Speeds, Productions, etc.

SAMPLE CARDING.—Each student is required to make at least twenty Sample Mixes combining different colors and grades of Stock and to felt and mount the same; part of the carding to be done by Hand Cards and part on the Torrance Sample Mixing Card.

Woolen Mule

Principles of Spinning. History and development.

Hand Jack, Self-operating and Self-acting Mules. The Mule-head.

Methods of driving the various parts, Rolls, Spindles, Carriages, etc. Backing-off. Winding Mechanism.

Study of the Quadrant and Builder-rail. Regulation of the Fallers.

Double Spinning. Twisting on Mule and on Woolen Twister.

Top Making

CARDING AND PREPARING—The principles of Worsted Carding—Types of Worsted Cards, Double Cylinder Lickerin, Breast.

Speeds, Settings, Feeds, Adjustments, Productions.

PREPARING—Differences between Carding and Preparing—What Wools are Prepared and why they are not Carded. The use of Emulsions. A Set of Preparers. The calculations for Drafts on any Gill Box. The Clough Gill Box.

The proper Drafts in Preparing—Adjustments, Speeds, Productions, Calculations.

GILLING AFTER CARDING—Number of Doublings, etc.

Combing

The principles, history and development of Worsted Combing.

Combing on the Noble and Lister machines.

Calculations for Draft—Settings, Speeds, Productions.

Per cent. of noils.

GILLING AFTER COMBING—Proper Drafts and calculations for Doublings.

BACK WASHING—The object and nature of the process—Backwashing Liquors, Composition, Heat.

The Hydroscopic Property of Wool, Conditioning of Tops, Top Mixing.

Open Drawing or Bradford System

The Principles of Drawing. Numbers of Operations for different counts of yarn. The use of Logarithms in Drawing Calculations. Study of the Drag, Calculations for Drafts and Twists, Proper Ratch.

The functions of the Weigh Box.

Measuring Stop Motions, Candle Stick, Side Knock-off.

Calculations for length.

Construction and use of Gauge Points or Constants.

Effects of Doubling.

The Dram and Hank Systems for numbering Roving.

Cone Drawing

The Object and Use of Cone Drawing, Differential Motions, Builder Motions, Calculations for Draft, Twist-Tension and Lay, Adjustments, Speeds and Productions.

French Drawing

The principles and use of French Drawing—Functions of the Porcupine. The principles of Condensing—Manufacturing of Merino Yarns.

Spinning, Open or Bradford System

The Principles of Spinning. Calculations for Draft and Twist, Spinning on the Cap, Flyer and Ring Frames, The Scaife Builder Motion, Drag in Bradford System of Spinning, the use of Straight, Conical and Bell Mouthed Caps. Top Roll, Single and Double Covered, Iron and Wood.

Types of Frames, Leicester and Illingworth; Speeds, Productions.

Spinning, French System

Principles of Worsted Mule Spinning, Calculations for Draft and Twist, Ratch, Drag, Backing off, Winding, Re-engaging, Size and shape of Caps, Builder Motion, Quadrant, Metric and English systems of Calculations.

Twisting

Principles of Twisting, Reeling, Weighing and Numbering of Single and Ply Yarns, Twisting on Cap, Flyer and Ring Frames, Calculations for Twist, Twist Testing, Trap Twisters, Effect of direction of Twist; Speeds, Productions, Yarn Testing.

The true difference between Woolen and Worsted Yarns. Layout of Machinery for different classes of Yarns, Power required for different machines, Cost of Machinery and Approximate Labor Cost of each Department, Sorting, Scouring, Carbonizing, Picking, Carding, Combing, Drawing, Spinning, Twisting, for various classes of Yarns, Carpet, Braid, Botany.

[COURSES I-4, II-3, III-3, VI-3]

FINISHING DEPARTMENT—H

Woolen and Worsted Finishing—H-1

PREPARATION: C-I, D-I, D-9

The outline of this course which is given by means of lecture and laboratory work is as follows:

Burling and Mending

Under this head is taken up for consideration the examination of flannel as it comes from the loom, the construction, use, and location of the perch, the methods used in marking defects, measuring, weighing, and numbering of cloths, also the methods of inspection for fancies, single cloths, and double cloths. The object of burling, mending, and the types of tables employed, the method of removing knots, runners, etc., the object of back shearing and the use of burling irons, the replacing of missing threads and the importance of sewing as a part of the finishing process, are all considered in detail. The removal of oil and tar spots as well as stains of various kinds is studied.

Fulling

This branch covers a study of the conditions of the flannel as it comes from the loom, the influence of oil, size, etc. upon the procedure. Considerable time is devoted to the various methods of producing a felt, the early types of stocks, hammer falling and crank stocks, and their modifications and development into the present type of rotary fulling mills of both the single and double variety. The details of construction in all machines are carefully taken up and include the design and composition of the main rolls, methods of covering, regulation and means of adjusting the pressures of traps and rolls, consideration of the shoes, the use and regulation of the various types of stop motion, the different types of stretchers, guide rolls, and throat plates.

The theory of felt is taken up and the influence of pressure, moisture, heat, alkali, and acid is considered as well as the hydroscopic and felting properties of different wool fibres. The preparation of the flannel for the mill and the usual methods of determining shrinkages as well as the various methods of soaping are given careful attention. The preparation of various fulling soaps and the value of each for the production of various degrees of felt as well as the determination of the proper amount of alkali for various goods are carefully studied and demonstrated. The manipulation of the various kinds of goods in the mill, viz.: all wool, shoddies, and mixed goods, is studied in class room and by operation in the mill.

The changes in weight and strength for each operation are carefully considered, as is also the value of the flocks made in each. A study of

the various methods of flocking, such as dry and wet are considered in both class and machine rooms. In each operation the defects likely to materialize are studied as well as the cause thereof, and various methods of modifying or lessening them.

Washing and Speck Dyeing

This branch considers the scouring, rinsing and washing of goods both before and after the fulling process; the various types of washers and the details of construction, such as suds, box, rolls, etc. The theory of scouring, uses of Fuller's earth, salt solutions, and sours, on the different kinds of goods is made clear by practical work in the machine room, where the defects due to improper scouring such as stains, cloudy effects, wrinkles and unclean goods, are demonstrated. The discussion of the necessity of speck dyeing follows naturally from the study of these matters and includes methods of preparation, materials used, application and tests required.

Carbonizing

This is an important branch of finishing and includes a study of the various carbonizing agents, methods of application, strength of solutions, and neutralizing, as well as the machines used. Stains and imperfections resulting from carbonizing are also considered. The drying and tentering machines and extractors employed are taken up at this point.

Gigging, Napping and Steaming

The construction in detail of the various types of gigs, nappers, steamers, wet gigs, rolling, stretching, crabbing and singeing machines, is discussed and their actions upon the cloth and the results obtained are explained.

Various methods of obtaining lustre and the production of permanent finish are considered in connection with steaming and sponging.

Brushing, Shearing and Pressing

This includes as do the other branches a careful treatment of the machines employed, the preparation of the cloth for each process, the action of each machine in producing its part of the resultant effect. With the manipulation of the shear comes the matters of setting, grinding, and adjustment. With the brushing machine the effect of steaming and moisture upon the lustre and feel of the goods is shown. A study of the action of the presses both plate and rotary involves consideration of pressure, steaming, etc. Special processes to obtain particular effects are taken up and the part played by each machine is explained. The details involved in handling cloth on a commercial scale, as for example,

measuring, weighing, ticketing, numbering and rolling, are also explained. The necessary calculations and the methods of finishing all grades of goods are considered from time to time during the year.

[COURSES I-4, II-4, II-3, III-3, VI-3]

Cotton Finishing—H-2

PREPARATION: C-I, D-I, D-9

The outline of the course in the Finishing of Cotton Fabrics is as follows:

Cloth Room

Inspection of the various goods and the object thereof. Construction of the various types of inspecting and trimming machines.

Shearing

The object. A consideration of the various types of shears for treating one or both sides at the same time, also the use of the usual cleaning devices, such as emery, sand, and card rolls, beaters and brushes. Grinding and the adjustment of the various parts.

The use of brushing and cleaning machines, rolling devices, and calender attachments, for grey goods.

Singeing

Developing and object of singeing. The construction of singers of all types, and for various purposes. The use of cooling tanks, steaming-devices, rolling and brushing attachments.

Regulation of the flame for various goods and adjustment of the parts. Gas and air pressure, water cooled rolls. The effect of moisture on the cost of singeing. The use of dry cans in connection with singeing. Electric singeing.

Washing

Open width and string washers. Their construction and operation. Soaps, temperature, squeeze rolls. Washing of various goods and the object thereof. Stains.

Napping

The object of napping and the usual method of treating goods. Various types of nappers—Single and Double acting, Felting nappers. Construction, grinding, and adjustment of various types.

Water Mangles

Their object and the construction of various types. Various rolls, iron, husk, etc. Scutchers: their object and construction.

Starch Mangles

The object and construction of all types of starch mangles for pure starch and filled goods. Various types of rolls, brass, rubber, wood. Action of doctor blades, etc. Regulation and object of pressure.

Methods of starching and finishing all standard goods, also a consideration of the various substances used, such as starch, softener, and fillers. The preparation of starch and various methods of application.

Dryers and Stretchers

Both horizontal and vertical, tenter frames, clips. The swing motion and the finishes thus produced. Construction. Spraying machines, belt stretchers, button breakers. Their object and construction.

Calenders

The object and construction of all types, including the regulation of pressure and nips for the production of various finishes. Various types of rolls and their uses, steel, husk, and paper. The use of hot and cold rolls. Chasing, friction, embossing and Schrier calenders, and the various finishes produced by each. Production of watered effects. Beetling machines.

Making up room—yarding, inspecting. Different types of folds. Pressing, papering, marking.

[COURSES I-4, I-3, VI-3]

PHYSICAL CULTURE—I

This subject is required of all students registered for first year work. The course consists of general athletic exercises with small squads on the campus during the pleasant weather of the fall and spring, and exercises in the school gymnasium during the winter months. The instruction is given by the director of physical culture. Previous to the commencement of the work in the fall, each member of the class is required to submit to a thorough physical examination, a careful record of which is kept. Again at the end of the year another examination is held that progress may be noted.

The student's record depends both upon his regularity of attendance and upon the character of his work. A student who is not regular in attendance or who does not make sufficient progress in the work will be required to repeat the subject during the second year.

[ALL COURSES]

Evening Classes

ENTRANCE REQUIREMENTS AND FEES

All applicants to the evening classes must understand the English language and simple Arithmetic. Those who are graduates of a Grammar School are admitted upon certificate. A blank form for this will be found in the back of the catalogue. Those who cannot present such a certificate are required to take examinations in the subjects of English and Arithmetic. In the examination in English a short composition must be written on a given theme, and a certain amount must be written from dictation. In the examination in Arithmetic the applicant must show suitable proficiency in addition, subtraction, multiplication, division, common and decimal fractions, percentage, ratio and proportion. Opportunity to register or to take these examinations is offered each year, generally on the Thursday evenings of the three weeks previous to the opening of the evening school.

All students whether from Lowell or elsewhere taking courses in the Chemistry and Dyeing Department must before entering the laboratory make a deposit as follows:

Course IVa	\$ 5.00 per year
Course IVb, IVc or IVd	\$10.00 per year

This is to cover the cost of laboratory breakage and chemicals, and at the end of the year any unexpended balance is returned or an extra charge made for excess breakage.

The evening classes usually commence in the month of October and continue until about the middle of March. Some classes do not finish until April first. The school is open on four evenings each week during the period mentioned except when the school is closed for holiday recesses. The schedule showing the arrangements of classes for each term will be announced at the beginning of the school year.

Before entering class all students must fill out an attendance card which can be obtained at the office or from the instructors in the various departments. Any student who has filed an attendance card and who wishes to change his course, should notify the office to that effect.

COURSES

The evening classes offer to those who are employed during the day, instruction pertaining to their daily work or instruction in such branches as are related to the particular department in which they are engaged. Thus, one who is a weaver can carry on a course in Spinning or Designing. A dyer or an employee in a dye house can by means of a course in Chemistry and Dyeing acquire a better and more accurate knowledge of the chemicals and material he is handling during the day. A machinist working on a lathe, planer, milling machine or at a bench, may add to his accomplishments, a knowledge of drafting, mechanism, and other subjects. This means that any man, young or old, who has the fundamentals of common school education, and who has the determination to advance, may secure in proper sequence the stepping stones to the place toward which he is looking, and rise to even the highest position in the industry.

The courses of the evening school are varied and arranged to meet the special needs of those engaged in the industry. They vary in length from one year to three and at the completion of each course, the certificate of the school is awarded, providing, however, that the student has been in attendance in the course during the year for which the certificate is granted.

No certificate will be awarded until all dues to the school have been discharged.

1. Cotton Spinning—2 Years

In this course the cotton is taken as it is raised in various parts of the world, and instruction is given in the various processes on all the machines from gin to spinning frame and mule. For one who desires only a study of combing, carding or spinning, it is possible to take that part of the course in which he is

particularly interested, although it is believed to be better for a spinner to know something about the machines and processes that precede his own. If one, all his life, has worked with one grade of cotton, an understanding of the other types and grades of cotton, of their properties, methods of cultivation, localities where grown, and uses to which they are adapted, cannot but help to broaden his intellect and make him a more valuable man.

A detailed study of the machines including speeds, drafts, and settings explains and makes clear to the student the arbitrary orders of the mill overseer. There is not time in the mill for explanations as to why a certain change gear is used or how the draft constant is determined. The relative advantages of the many types of mechanisms are considered.

IIa. Woolen Spinning—2 Years

IIb. Worsted Spinning—3 Years

In both courses the students of the first year pursue the same class work covering instruction in the many kinds of wool, the varying properties of the fibres, trade terms, sorting, scouring, carbonizing, etc. This work is followed by instruction in carding and mule spinning for the woolen students. For those desiring to study worsted yarn manufacture work is taken up on the worsted card, followed by gilling and combing and processes of top making. The last year of this course is devoted to a study of worsted yarn manufacture on both the English and French systems.

Thus in three years' time one may acquire a thorough course of instruction in worsted yarn manufacturing, or in two years, a knowledge of woolen yarn manufacture. He is thus able to obtain a knowledge of machines and processes that could not be obtained in the ordinary course of events in the mill.

IIIa. Textile Design—3 Years

For one who is working in the design, pattern or weave room, the course in design offers instruction in the great variety of weaves, in cloth construction and analysis. It is practically impossible under ordinary circumstances for one to acquire in

the mill a knowledge of the construction of the many textile fabrics. Where a person spends the greater portion of his life in one or two mills, his knowledge of fabrics is confined to those made in the mills in which he works. A course in designing supplements the experience received during the day, thus broadening a person's textile knowledge as well as making him better acquainted with the fabrics upon which he works daily.

IIIb. Freehand Drawing—3 Years

In the course in Freehand Drawing, instruction is given in the drawing from models, casts and designs. Work is taken up in charcoal and also in colors. This course has appealed to many young women of the city and it is believed that this is a most fortunate opportunity for both young women and young men of Lowell to acquire the elements of artistic designing.

IVa. Elementary Chemistry—2 years

General Chemistry including Inorganic and Organic. Qualitative Analysis.

IVb. Textile Chemistry and Dyeing—3 years

Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Dyeing.

IVc. Analytical Chemistry—3 years

Laboratory Work and Lectures in Quantitative Analysis.

IVd. Textile and Analytical Chemistry—4 years

Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Analytical Chemistry.

Hardly any branch of applied science plays so important a part in our industrial world as Chemistry. Many large mills employ the chemist as well as the dyer, and with the great progress which is being made in the manufacture and application of dyestuffs, a basic knowledge of chemistry becomes an absolute necessity to the dyer. Within a comparatively short distance from Lowell are establishments employing men who require some knowledge of chemistry but who may not necessarily use dyes. Some find a knowledge of analytical chemistry helpful in their everyday work.

To meet these varying needs of our industrial community, the school offers a two year course in General Chemistry, Organic and Inorganic, which may be followed by any one of three courses, viz., Textile Chemistry and Dyeing, Analytical Chemistry and Textile and Analytical Chemistry. In order to take Courses IVb, IVc or IVd, candidates must have a certificate from Course IVa, or show by examination or approved credentials that they have taken the equivalent of the work covered by this course.

Va. Cotton Weaving—1 year

Vb. Woolen and Worsted Weaving—1 year

Vc. Dobby and Jacquard Weaving—1 year

These are called weaving courses, but in reality they might more properly be called courses in loom fixing for particular attention is given to the mechanism of the looms, the timing of the various parts and the adjustments possible to produce desired results. Here again, is an opportunity for students to fix, dismantle, erect and adjust looms in a way that could not be tolerated in any mill. Frequently students come to the classes with the knowledge that certain adjustments must be made upon a loom if certain results are to be obtained, but the reason for these is not known. The school offers the machine, time and instructor in order that the weaver, or loomfixer, may determine for himself the reason for some rule which he practices in his daily work. Not only can he become more familiar with the loom upon which he works every day, but he can study the operations of many other makes of looms.

VIa. Elements of Engineering—3 years

VIb. Mechanical Drawing—3 years

VIc. Machine Shop Practice—2 years

These courses have been arranged with the object of offering to those engaged in the mechanical and electrical departments of our mills, opportunities to learn something concerning the theory underlying the many practical methods which they pursue during the day.

Under the head of Elements of Engineering is given instruction in Mechanics and Mechanism of machines for one

year, followed by a year's course on steam boilers and engines with the auxiliary apparatus found in a modern steam plant. In the third year a brief course in Applied Electricity takes up, as far as time will permit, instruction in alternating and direct current generators, motors and apparatus.

For one having occasion to make a sketch or detail drawing for the purpose of illustration or instruction, or for one who is daily required to work from a drawing or blue print, the course in Mechanical Drawing is offered. It first lays a foundation of the principles of mechanical drawing and follows this with two years' work in drawing directly from parts of machines, preparing both the detail and the assembly drawing.

The Machine Shop Course is almost self-explanatory. The school has one of the best equipped shops for instruction purposes in this vicinity. Nearly all of the standard machine tools are represented, and it is possible to do almost any kind of machine tool work which comes within the range of the tools.

Thus it becomes possible for one who may be working at the bench during the day to learn how to operate a lathe or other tool, or for a lathe hand to acquire a knowledge of a planer, shaper, milling machine, grinder, etc. A man who has a knowledge only of the special machine which he operates, may by means of this course, become a more intelligent machinist. He should supplement this course with the courses in Mechanical Drawing and Mechanism in order that his training for an all-round machinist or mechanic may be more complete.

VII. Woolen and Worsted Finishing—1 year

In this course machine work is supplemented by lectures and discussions pertaining to the many finishes given to woolen and worsted fabrics. The action of soaps, water, steam, heat and cold upon wools in cloth or the combination of this fibre with others used in commerce is carefully studied. This course also helps the finisher to broaden his knowledge of textile fabrics.

OFFICERS OF ADMINISTRATION AND INSTRUCTION

Principal

CHARLES H. EAMES, S. B., Massachusetts Institute of Technology, 1897. Experience: Secretary of the Lowell Textile School and instructor in electrical engineering and mathematics; superintendent, Light, Heat and Power Corporation, Lowell, and engineer with Stone and Webster, electrical engineers, Boston, Mass.

Instructors

TEXTILE ENGINEERING

GEORGE H. PERKINS, S. B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience: Draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood Greene and Co., Boston, Mass.

HERBERT J. BALL, S. B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906. Experience: Draftsman, Watertown Arsenal.

ULYSSES J. LUPIEN, S. B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: Draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.

DAVID M. HUNTING, A. B., S. B., assistant instructor in mechanical drawing. Harvard College, 1904; Massachusetts Institute of Technology, 1913.

CHARLES H. JACK, instructor in machine shop practice. Lowell Textile School. Experience: Amoskeag Manufacturing Company, Manchester, N. H.

CHEMISTRY AND DYEING

LOUIS A. OLNEY, S. B., M. S., chief instructor. Lehigh University, 1896. Experience: instructor, Brown University; dyeing and finishing department, Stirling Mills, Lowell, Mass.

MILES R. MOFFATT, S. B., instructor in chemistry. Columbia University, 1901. Experience: assistant instructor in physics, Columbia University; chemist, Mallinckrodt Chemical Works, St. Louis, Mo.; chemist, Atlantic Mills, Providence, R. I.

ROBERT R. SLEEPER, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday and Sons, Limited, New York City; H. A. Metz and Co., New York City; Hamilton Print Works, Lowell, Mass.; Merrimack Manufacturing Company, Lowell, Mass.

- HOWARD D. SMITH, PH. D., instructor in chemistry. Tufts College, 1906; Brown University, 1904; Rhode Island College, 1901. Experience: assistant instructor, Brown University and Tufts College; instructor, Beloit College, Wisconsin.
- RUSSELL B. STODDARD, A. B., assistant instructor in chemistry. Clark College, 1912.
- LYOYD VAN DOREN, PH. D., instructor in chemistry. Pennsylvania College, 1909; Johns Hopkins University, 1912.
- HAROLD W. LEITCH, assistant instructor in chemistry. Lowell Textile School, 1912.
- WARREN H. WHITEHILL, assistant instructor in dyeing. Lowell Textile School, 1912.

TEXTILE DESIGN AND WEAVING

- HERMANN H. BACHMANN, chief instructor. Gera Textile School, Germany. Experience: Gustav Weise Public Designing House for the City of Gera; Parkhill Manufacturing Company, Fitchburg, Mass.; Lorraine Manufacturing Company, and Smith Webbing Company, Pawtucket, R. I.
- STEWART MACKAY, instructor in textile design and cloth analysis. Lowell Textile School, 1906. Experience: Bay State Mills, Lowell, Mass.; George C. Moore Wool Scouring Mills, North Chelmsford, Mass.
- STARR H. FISKE, assistant instructor in design and weaving. Lowell Textile School, 1909. Experience: Amoskeag Manufacturing Company, Manchester, N. H.
- JOSEPH WILMOT, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.; Draper Company, Hopedale, Mass.; Crompton and Knowles Loom Works, Worcester, Mass.
- ALBERT E. MUSARD, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder and Ellis, Philadelphia, Pa.; Nye & Wait Carpet Co., Auburn, N. Y.
- E. ELIZABETH WHITNEY, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching eighteen years.

COTTON YARNS

- STEPHEN E. SMITH, chief instructor. Lowell Textile School, 1900. Experience: draftsman, Saco-Lowell Shops, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.
- HERBERT C. WOOD, instructor in cotton yarns. Lowell Textile School, 1906. Experience: Tremont and Suffolk Mills, Lowell; Whitin Machine Works, Whitinsville, Mass.

HENRY K. DICK, instructor in knitting. Experience: Linnville Hosiery Factory, Lanark, Scotland.

WOOLEN AND WORSTED YARNS

EDGAR H. BARKER, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, Mass.; wool scouring.

JOHN N. HOWKER, instructor in wool sorting and scouring. Technical School of Saltaire near Bradford, England; certificate from City and Guilds of London. Experience: Saltaire Mills, Yorkshire, England; Goodall Worsted Company, Sanford, Maine; Arlington Mills, Lawrence, Mass.

EUGENE C. WOODCOCK, instructor in woolen and worsted yarns. Lowell Textile School, 1907. Experience: Wood Worsted Mills, Lawrence, Mass.

JOHN C. LOWE, instructor in woolen and worsted yarns. Lowell Textile School, 1911. Experience: Wood Worsted Mills, Lawrence, Mass.

FINISHING

ARTHUR A. STEWART, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woolen Manufacturing Company, Montreal, Canada; American Woolen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor in woolen and Worsted yarns, Lowell Textile School.

LANGUAGES AND HISTORY

LESTER H. CUSHING, A. B., Harvard College, 1911.

PHYSICAL CULTURE

RALPH E. GUILLOW, physical director. International Y. M. C. A. Training School, Springfield, Mass., 1910. Ten years' experience in physical culture in various schools and institutions.

ARCHIBALD R. GARDNER, M. D., medical adviser. Harvard University, 1902.

ALUMNI ASSOCIATION

The Alumni Association of the School holds its annual meeting and banquet in Lowell on commencement day.

The membership of the Association is restricted to graduates of the day school. Honorary membership is open to the Board of Trustees, the Faculty and such others as may be elected by the Association.

The officers for the year ending June, 1913 are:

President:	Everett B. Rich, '11
Vice-President:	Robert L. Lamont, '12
Secretary-Treasurer:	Arthur A. Stewart, '00

Board of Directors: The President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, for one year, and Stephen E. Smith, '00, for two years. Communications should be addressed to Arthur A. Stewart, Lowell Textile School.

OLNEY CHEMICAL ALUMNI OF THE LOWELL TEXTILE SCHOOL

This association was organized in 1908, for the purpose of keeping its members in closer relationship with each other and the school.

The membership consists of evening graduates from any of the advanced courses in chemistry and dyeing of the Lowell Textile School, and is composed of thirty members at present.

The annual meeting is held during the winter months at the school, and the annual reunion is held the third Saturday of June at a place selected by the Board of Control.

OFFICERS

President:	Hugh Christison, Methuen, Mass.
Vice-President:	James Spurr, Lawrence, Mass.
Secretary and Treasurer:	H. Stewart Redman, Lowell, Mass.

BOARD OF CONTROL

President, Vice-President, Secretary, also John A. Barrington of Philadelphia, Pa.; Forster Heaton, Millbury, Mass., and Harry Buckley of Methuen, Mass.

O. C. A. PRIZE COMMITTEE

H. Stewart Redman
Forster G. Heaton
Peter F. O'Neil

This association will offer each year a book prize to the evening graduate who attains the highest standing in any one of the advanced courses of the Chemistry and Dyeing Department.

For information regarding this association please apply to H. Stewart Redman, Secretary, 442 Beacon Street, Lowell, Mass.

DAY CLASS OF 1912

Graduates with Titles of Theses

Diplomas awarded as follows June 7, 1912:

- | | | |
|---------------------------|--|----------------------|
| Prescott Fenno Bigelow, | Wool Manufacturing,
"The Manufacture of a Piece-dyed Worsted Serge." | Jamaica Plain, Mass. |
| Rollins Brown, | Chemistry and Dyeing,
"Study of the Coloring and Printing of Wall Papers with a
Special Investigation of their Fastness to Light." | Salem, Mass. |
| Charles Bisbee Coan, | Chemistry and Dyeing,
"Investigation of the Mordanting of Wool with Chromium,
Iron and Aluminium with the Object of determining
the Amount remaining in the Mordanting Bath
after the Mordanting Process is Complete." | Ward Hill, Mass. |
| Richard Goldsmith Conant, | Cotton Manufacturing,
"The Manufacture of a Shirting." | Littleton, Mass. |
| Gregory Smith Dalton, | Chemistry and Dyeing,
"A Method by which a Reduction Vat Color taken
up by Cotton Fiber can be determined." | Lawrence, Mass. |
| Elmer Ellridge Dearth, | Chemistry and Dyeing,
Thesis with R. V. Roche,
"Bleaching and Dyeing of Straw, and the
Dyeing of Vegetable Ivory." | Lowell, Mass. |
| Gordon Baylies Elliot, | Wool Manufacturing,
Thesis with R. L. Lamont,
"The Manufacture of a Broadcloth." | Grafton, Mass. |
| Karl Emil Engstrom, | Textile Engineering,
"The Effect of Compression on the Steam Consumption
of Corliss Engines." | Lancaster, Mass. |
| Harold Benjamin Frost, | Wool Manufacturing
, Thesis with H. Yavner,
"The Manufacture of a Fancy Worsted." | Somerville, Mass. |
| Paul Joseph Hassett, | Chemistry and Dyeing,
"The Functions of Sulphuric Acid in the
Dyeing of Acid Colors." | Fitchburg, Mass. |
| Otis Milton Holmes, | Textile Engineering,
"Economizer Tests." | Haverhill, Mass. |
| Leslie Newton Hood, | Chemistry and Dyeing,
"Study of Some Possible Applications of Molybdenum
Compounds in Coloring Textile Material." | Nashua, N. H. |
| Robert Laurance Lamont, | Wool Manufacturing,
Thesis with G. B. Elliot. | Malden, Mass. |

- Harold Watson Leitch, Chemistry and Dyeing, North Andover, Mass.
 "Investigation of the Action of Alkalies upon Wool with
 the Object of determining the Effect of Concentration
 and Temperature of Alkaline Solutions upon the
 Physical Properties of the Wool."
- Sydney Philip Munroe, Cotton Manufacturing, Melrose, Mass.
 "The Manufacture of White Dress Goods."
- Robert Scott Niven, Textile Engineering, Saugus, Mass.
 Thesis with J. D. Sullivan,
 "Efficiency Tests of Can Drying Machines."
- James Gilbert Pottinger, Wool Manufacturing, West Roxbury, Mass.
 "The Manufacture of a Fancy Worsted."
- Raymond Vincent Roche, Chemistry and Dyeing, Uxbridge, Mass.
 Thesis with E. E. Dearth.
- Arnold Dearborn Rundlett, Textile Engineering, Haverhill, Mass.
 "The Application of the Bleeder Type of
 Steam Turbine at the Lowell Bleachery."
- Francis James Shea, Wool Manufacturing, Ware, Mass.
 "The Manufacture of a Fancy Worsted."
- John David Sullivan, Textile Engineering, Bradford, Mass.
 Thesis with R. S. Niven.
- Joseph Blake Thaxter, Jr. Wool Manufacturing, Hingham, Mass.
 "The Manufacture of a Fancy Worsted."
- Warren Hall Whitehill, Chemistry and Dyeing, Groton, Mass.
 "The Production of Two Color Effects upon All Wool Piece
 Goods through the Agency of Chlorinated Wool."
- Harry Yavner, Wool Manufacturing, Somerville, Mass.
 Thesis with H. B. Frost.

EVENING CLASS OF 1912

Certificates awarded as follows, April 24, 1912:

COURSE Ia—2 YEARS. (Cotton Spinning)

Wilfred Beech	Lowell, Mass.
Albert Courtenay Brainerd	Lawrence, "
Harry Clinton Brainerd	" "
Charles Dudley Browne	Lowell, "
Henry Kendal Dick	" "
Newton Sperry Frothingham	" "
James Royds	" "
Robert Pevey Stevenson	" "
Frederic George Towers	Lawrence, "
Orrin Hutchins Webster	Lowell, "

COURSE IIb—3 YEARS. (Worsted Spinning)

Walter Fridolf Boije	Lowell, Mass.
Harry Lambert	Methuen, "
John Charles Lowe	" "
Frank Louis Orrell	Lowell, "

COURSE IIIa—3 YEARS. (Textile Designing)

Fred Sherburn Buzzell	Methuen, Mass.
Ralph Alfred Dittman	Haverhill, "
John Augustus Dollbaum	Lowell, "
Joseph Henry Higginson	Haverhill, "
Walter Francis Holland	Lawrence, "
Alderic Seraphin Lapierre	Lowell, "
Edward Thomas Riley	North Billerica, "
Harold Scott Stevens	Lowell, "
Albert Greaves Sugden	" "
Frederic Malcolm Wicks	Haverhill, "
Joseph Wilkinson	Lowell, "

COURSE IIIb—3 YEARS. (Freehand Drawing)

Eugene Blanchette	Lowell, Mass.
Ingrid Israella Pihl	" "

COURSE IVa—2 YEARS. (Elementary Chemistry)

John William Clark	Lawrence, Mass.
Charles Edward Dulligan	Lowell, "
Charles Henry Egan	Boston, "
Ralph William Freeman	Lowell, "
Philip Joseph LaPorte	" "
Charles Naylor	" "
Charles Fredric Savage	" "
Victor Emanuel Swanson	" "
Roderick Turgeon	" "

COURSE Va—1 YEAR. (Cotton Weaving)

Charles Bramley	Methuen, Mass.
George Alexander Preble	Lowell, "
William Brown Prescott	" "
John Vause	Methuen, "
Arthur Silas Wood	Lowell, "

COURSE Vb—1 YEAR. (Woolen and Worsted Weaving)

Euthimios Daskalakis	Lowell, Mass.
William Henry Donahey	" "
George Edward Hibbert	" "
Joseph Edward Leith	" "
Martin McCann	" "
Joseph Charles Michael	" "
Herbert Haskins Ward	" "

COURSE Vc—1 YEAR. (Dobby and Jacquard Weaving)

Grant Jasper	Lowell, Mass.
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COURSE VIa—3 YEARS. (Elements of Engineering)

Arthur John Kerrigan	Lowell, Mass.
Chester Wallace Macdonald	" "
Carl Hugo Palm	" "
Henry Stewart Redman	" "

COURSE VIb—3 YEARS. (Mechanical Drawing)

John Oscar Christenson	Lowell, Mass.
John Francis Graves	" "
Arthur Kent	" "
Joseph Michael Muldoon	Lawrence, "
Russell Purdy Skidmore	Lowell, "
Harold Samuel Taylor	" "

COURSE VIId—2 YEARS. (Machine Shop)

Joseph Emmett Bernard	Lowell, Mass.
Emile Blais	" "
Hans Mauritz Hansen	" "
Frank Jackson	Lawrence, "
John Leontius Lockberg	Lowell, "
William Francis Smith	" "

COURSE VII—1 YEAR. (Woolen and Worsted Finishing)

Walter Fridolf Boije	Lowell, Mass.
Thomas Henry Broderick	North Andover, "
George Joseph Burke	Dracut, "
Goddard Oscar Carlson	Lowell, "
Ralph Footman Greenwood	Lawrence, "
George Tyler Hartshorn	Lowell, "
James Charles Hutchings	Lawrence, "
Henry Edson Rollins	" "
David Douglas Shearer	" "

REGISTER OF DAY STUDENTS

1912-1913

Fourth Year

Name	Course	Address
Holmes, Otis M.	VI	Haverhill, Mass.
Leitch, Harold W.	IV	Lowell, "
Pensel, George R.	IV	Fitchburg, "

Third Year

Bennett, Herbert B.	II	Lowell, Mass.
Church, Harold P.	Sp. III	Providence, R. I.
Cleary, Charles J.	II	Boston, Mass.
Cook, Kenneth B.	I	Concord, "
Creese, Guy T.	IV	Danvers, "
Davieau, Arthur N.	VI	Cochituate, "
Davis, Alexander D.	VI	Lowell, "
Dearborn, Roy	VI	Andover, "
Feindel, Catherine E.	Sp. III	Chelmsford, "
Gadsby, Arthur N.	II	North Adams, "
Horton, Chester T.	VI	Wilmington, "
Johnson, Arthur K.	IV	Andover, "
Kaplan, Morris	IV	Boston, "
Lillis, Marvin H.	IV	Lawrence, "
Mather, Harold T.	VI	Lowell, "
Murray, James	IV	Lawrence, "
Peck, Carroll W.	IV	Marshfield, "
Pillsbury, Ray C.	I	Manchester, N. H.
Plummer, Elliott B.	IV	Lawrence, Mass.
Putnam, Philip C.	IV	Danvers, "
Rayner, Charles H.	IV	Waltham, "
Richardson, Richardson P.	I	Lowell, "
Shedd, Howard P.	IV	West Medford, "
Sylvain, Charles E.	VI	Lowell, "
Walen, Ernest D.	VI	Gloucester, "

Second Year

Abbott, Fred A.	II	Dexter, Me.
Alexander, Charles H., Jr.	Sp. I	Dallas, Texas
Blake, Parker G.	VI	Cambridge, Mass.
Bradley, Raymond F.	VI	Gloucester, "
Brickett, Raymond C.	II	Haverhill, "
Casey, William F.	I	Allston, "
Colby, Lawrence W.	IV	Andover, "
Cosendai, Edwin F. E.	IV	Saginaw, Mich.
Crawford, Jack W.	IV	Lawrence, Mass.
Cudlip, Carroll M.	Sp. I	St. John, N. B.
Dawson, George I.	VI	Somerville, Mass.
Dorr, Clinton L.	VI	Malden, "
Fisher, Russell T.	VI	Gloucester, "
Folsom, Harold G.	IV	Lowell, "
Greer, John H., Jr.	IV	Lawrence, "

Name	Course	Address
Kyle, George S.	I	Columbus, Ga.
Lamb, Horace E.	II	Rockland, Me.
Lane, Oliver F.	IV	Lowell, Mass.
Laughlin, Edwin T.	IV	Cohoes, N. Y.
Lawson, Edward R.	VI	Andover, Mass.
McArthur, Osborn	II	Watertown, "
McCreery, Robert W.	Sp. IV	Glens Falls, N. Y.
McGowan, Frank R.	VI	Lowell, Mass.
Messenger, George A.	IV	Chicopee Falls, "
Messer, Ralph W.	VI	Billerica, "
Miller, Severn A.	III	Montclair, N. J.
Neyman, Julius E.	IV	Lowell, Mass.
Rich, Edward	IV	Manchester, N. H.
Richardson, George O.	IV	Andover, Mass.
Robertson, George O.	II	Lowell, "
Ross, Ernest E.	I	Stoneham, "
Rowe, Frank E., Jr.	VI	Winchester, "
Sawyer, Joseph W.	IV	Lawrence, "
Tucker, Harold B.	VI	Stoneham, "
Ware, Carle E.	Sp. I	Peabody, "

First Year

Adams, Arnold B.	II	East Bridgewater, Mass.
Adams, Floyd W.	VI	Madison, Me.
Alliot, Eric	I	Passaic, N. J.
Blake, Fraser H.	IV	Haverhill, Mass.
Carlson, Ernest B.	VI	West Chelmsford, "
Church, Charles W.	III	Great Barrington, "
Coleman, Wesley D.	IV	Cambridge, "
Echmal, John G.	VI	Lowell, "
Entwistle, Ralph T.	—	Monson, "
Farnsworth, Harold V.	VI	Winchester, "
Feeney, John F.	VI	Hudson, "
Ford, Austin L.	II	Lowell, "
Forsaith, Ralph A.	VI	Nashua, N. H.
Frothingham, William A.	IV	Portland, Me.
Frye, Whitney M.	Sp. VI	Boston, Mass.
Ginsburg, Albert	IV	Roxbury, "
Goodell, Josiah B.	II	Lowell, "
Goodman, Harry	Sp. III	Malden, "
Greene, Louis A.	I	Lowell, "
Harrington, Thomas	IV	Cambridge, "
Harvey, Wendell P.	Sp. IV	Lowell, "
Holt, Justin G.	VI	Cambridge, "
Houghton, Roland G.	IV	Littleton Common, "
Howarth, Charles L.	IV	Lowell, "
Irvine, James A.	VI	Chicago, Ill.
Jenkins, Harry E.	—	Lowell, Mass.
Kirby, Donald T.	IV	Lowell, "
Lamprey, Leslie B.	IV	Lawrence, "
Leonard, Charles W.	IV	Boston, "
Meara, Irving E.	Sp. III	Pittsfield, N. H.
Milot, Aram A.	II	Taunton, Mass.
Mitchell, Charles B.	VI	Saco, Me.
Mitchell, Nicholas L.	Sp. III	Hull, Mass.

Name	Course	Address
Newell, Herbert M.	I	Pawtucket, R. I.
Nolde, George H.	IV	Reading, Pa.
O'Brien, Philip F.	II	Wayland, Mass.
O'Connell, Maurice D.	Sp. III	Worcester, "
Park, Kenneth B.	IV	Winchester, "
Peach, Harold E.	IV	Salem, "
Purcell, James	—	Webster, "
Putnam, George I.	IV	Boston, "
Richmond, Lysander	IV	Middleboro, "
Riggs, Homer C.	VI	South Essex, "
Sanborn, Ralph L.	VI	West Kennebunk, Me.
Scott, William L.	II	Manchester, N. H.
Shambow, Wallace A.	Sp.	Woonsocket, R. I.
Simpson, Kenneth M.	VI	Malden, Mass.
Sinclair, Edward L.	IV	Somerville, "
Spencer, John H., Jr.	Sp. VI	Roland Park, Md.
Sturtevant, Herbert A.	VI	Cambridge, Mass.
Summersby, William C.	I	Lawrence, "
Sussman, Joseph A.	IV	Portsmouth, N. H.
Tenney, Frank F.	VI	Manchester, Mass.
Treadway, Wolcott W.	Sp. III	Lancaster, "
Wells, Frank H.	VI	Clinton, "
Woods, Harvey A.	VI	Groton, "
Wurm, Hugo	Sp. III	Barnstead, N. H.

Post Graduates

Name	Address
Barr, I. Walwin	New York, N. Y.
Brickett, Chauncey J.	Scranton, Pa.
Carter, Robert A.	Philadelphia, Pa.
Cole, James T.	Belmont, Mass.
Culver, Ralph F.	Wilmington, Dela.
Foster, Clifford E.	Lowell, Mass.
Haskell, Walter F.	Westbrook, Me.
Hildreth, Harold W.	Lawrence, Mass.
Hollings, James L.	Brooklyn, N. Y.
Knowland, Daniel P.	New York, N. Y.
Mailey, Howard T.	Lawrence, Mass.
Moorhouse, William R.	Boston, Mass.
Reynolds, Fred B.	North Andover, Mass.
Sleeper, Robert R.	Lowell, Mass.

REGISTER OF EVENING STUDENTS

1912-1913

Explanatory Note

Course Ia	Cotton Spinning
Course Ib	Knitting
Course IIa	Woolen Spinning
Course IIb	Worsted Spinning
Course IIIa	Designing
Course IIIb	Freehand Drawing
Course IVa	Elementary Chemistry
Course IVb	Textile Chemistry and Dyeing
Course IVc	Analytical Chemistry
Course IVd	Textile and Analytical Chemistry
Course IVe	Special Chemistry
Course Va	Cotton Weaving
Course Vb	Woolen and Worsted Weaving
Course Vc	Dobby and Jacquard Weaving
Course VIa	Elements of Engineering
Course VIb	Mechanical Drawing
Course VIc	Machine Shop
Course VIe	Mathematics
Course VII	Woolen and Worsted Finishing

Post Graduates

Name	Course	Address
Bernard, Joseph E.	VIc	Lowell, Mass.
Ledoux, Blanche H.	IIIb	" "
Racicot, Marie E.	IIIb	" "
Royds, James	Ia	" "
Smith, Wm. F.	VIc	" "
Towers, Frederic G.	Ia	Lawrence, "

Third Year

Bannister, John	VIa	Lowell, Mass.
Beaulieu, Wm. E.	IIb	" "
Bell, Charles W.	VIa	" "
Charleton, Peter	VIa	" "
Cook, Alfred C.	VIa	" "
Cote, Fred J.	VIa	Lawrence, "
Cote, George W.	VIa	Lowell, "
Curtis, Arthur	VIa	" "
Cuthill, Isaac	VIa	Andover, "
Downs, John	VIa	Lowell, "
Dunn, George C.	IVb	" "
Ekengren, Hilding C.	IIIb	" "
Fagan, Thomas M.	VIb	" "
Fernald, Hiram T.	VIa	" "
Flaherty, William	IIIa	" "
Gerry, Churchill	VIa	" "
Giffin, Charles H.	IIIa	" "
Giffin, George R.	IIIa	" "

Name	Course	Address
Giffin, Wm. J.	IIIa	Lowell, Mass.
Goodwin, Lloyd L.	VIa	Arlington, "
Gordon, Loyd H.	VIa	Lowell, "
Hannagan, Edward F.	I Ib	Lawrence, "
Higgins, Alfred	IIIa	" "
Hill, Rowland S.	VIa	Lowell, "
Hoelzel, Louis C.	VIa	Lawrence, "
Jones, Frank H.	VIa	Lowell, "
LaJeunesse, Joseph A.	IVc	" "
Lambert, Seth	I Ib	Methuen, "
Leaver, Raymond J.	VIb	Lawrence, "
Lunan, Karl S.	VIa	Lowell, "
McDonald, Wm. A.	VIb	" "
McGowan, Annie C.	IIIb	" "
McOsker, James F.	VIa	" "
Mahoney, James A.	VIa	Lawrence, "
Manning, James B.	IVb	Lowell, "
Metcalfe, Walter B.	I Ib	North Chelmsford, "
Milot, Joseph E.	VIa	Lowell, "
Murray, William H.	VIa	" "
Nicoll, John	IVb	Andover, "
Obst, Ehrich	VIa	Methuen, "
Randall, Wm. O.	I Ib	Lawrence, "
Redman, Arthur E.	VIa	Lowell, "
Roberts, Edward J.	VIa	" "
Rollins, Sidney R.	I Ib	Lawrence, "
Shaw, Albert	VIb	Lowell, "
Shaw, William	VIa	" "
Smith, Rothwell E.	VIa	" "
Sousa, Andrew P.	VIa	" "
Taff, Joseph	VIa	" "
Taylor, Ernest H.	VIa	" "
Taylor, Thomas L.	VIa	" "
Whitman, Wm. P.	IVb	" "
Whitworth, Albert	IIIa	" "
Willmott, Herbert J.	VIa	" "
Younger, Andrew	IIIa	" "

Second Year

Allen, Wm. J.	IVa	Lawrence, Mass.
Atkinson, Henry	IIIa	Lowell, "
Atkinson, Reginald	IVa	" "
Bachmann, Walter H.	IIIb	" "
Baldwin, George E.	VIb	" "
Barrell, Wm. A.	Ia	Lawrence, "
Bastow, Percy	IVb	Methuen, "
Berr, Herbert A.	IIIa	Lawrence, "
Brown, James H.	VIa	Forge Village, "
Brown, Leon E.	VIa	Lowell, "
Bryan, Levi A.	VIb	Andover, "
Burns, Richard L.	VIb	Lowell, "
Callahan, Daniel F.	VIa	" "
Campling, Frank	I Ib	Methuen, "
Carey, John H.	IVa	Lowell, "
Carlson, Frank W.	VI d	" "

Name	Course	Address
Clancy, Nellie A.	IIIa	Nashua, N. H.
Clark, John W.	IVb	Lawrence, Mass.
Clarke, Wesley J.	VId	Ballardvale, "
Colburn, Wm. A.	IVa	Lowell, "
Collins, Frank	VIa	Forge Village, "
Conway, John J.	VIa	Lowell, "
Cox, Edward J.	Ia	" "
Cudmore, Edward T.	VId	" "
Cullinan, Wm. H.	IIIa	Collinsville, "
Cushing, Lester H.	Ia	Lowell, "
Davis, Edward B.	VId	Ballardvale, "
Denio, Allen J.	VIa	Lowell, "
Devine, Mary F.	IVa	" "
Doole, John T.	IVa	" "
Doran, Hugh J.	Ia	" "
Dowd, Martin F.	IIIa	Lawrence, "
Doyle, John B.	VId	Lowell, "
Drouin, Joseph	VIa	" "
Dushame, Fred A.	IVa	Lawrence, "
Early, Wm. E.	VId	Lowell, "
Exley, Fred B.	VIa	Lawrence, "
Fales, Raymond D.	VId	Lowell, "
Feindel, Catherine E.	IIIb	Chelmsford Center, "
Forrest, Wm. R.	VId	Lowell, "
Freeman, George D.	VId	" "
Freeman, Ralph W.	IVb	" "
Gibbons, James J.	VIa	Lawrence, "
Gile, Harold E.	IVa	" "
Graham, John R.	VId	Lowell, "
Hackett, Edward F.	IIIb	" "
Haley, Henry T.	IIIa	" "
Hall, Sydney H.	VId	" "
Hanson, Edward	Ia	" "
Harnden, Edward F.	IId	" "
Hathaway, Henry B.	Ia	" "
Henzie, John J.	IIIa	" "
Herron, Alexander T.	Ia	" "
Hill, Bruce	IIIa	Lawrence, "
Hill, Ellsworth O. C.	IIIa	" "
Hoffman, Henry W.	IIIa	" "
Horman, Charles P.	IIIa	Lowell, "
Howker, John	Ia	" "
Hurley, Charles F.	VIa	" "
Huse, Charles H.	VId	" "
Jackson, Charles F.	VId	North Andover, "
Jackson, Walter J.	IIa-IIIa	Lawrence, "
Jennings, John J.	VIa	Lowell, "
Johnston, Thomas	VId	" "
Jones, Herbert	Ia	" "
Kirkpatrick, Harold B.	Ia	" "
Kirkpatrick, Lloyd A.	Ia	" "
Lamont, Robert L.	IVe-VId	North Andover, "
Laughlin, Edwin T.	Ia	Lowell, "
Laurin, Erick T. L.	VId	" "
Lawson, Ralph	Ia	" "
Leaver, Harold E.	IId	Lawrence, "

Name	Course	Address
Leith, Joseph E.	IIIa	Lowell, Mass.
Lewis, Charles S.	VIA	" "
Lovejoy, Robert L.	VIA	Collinsville, "
McComb, Arthur J.	VIId	North Chelmsford, "
McGee, David	IVA	Lowell, "
McGurn, James P.	VIId	" "
MacKenney, Harold E.	IIIB	" "
McQuade, William J.	VIb	" "
Mack, Clarence P.	IIIa	Lawrence, "
Mackenzie, Raymond	VIb	Lowell, "
Mayo, Fred R.	IVA	" "
Milot, Joseph E.	VIA	" "
Moffatt, Edward J.	VIA	" "
Monahan, Patrick H.	VIId	" "
Mott, Leroy W.	VIb	Ballardvale, "
Murray, Paul W.	VIb	Lowell, "
Nichol, Samuel J.	IVb	" "
Nichols, Fernald H.	VIb	" "
Normandy, Joseph M.	VIId	" "
O'Hagan, Christopher	VIb	" "
Orrell, Ernest R.	VIId	" "
Paquin, Marie N.	IIIB	" "
Pihl, Mansfred M.	VIb	" "
Richards, Raymond A.	IIIB	" "
Richburg, Clyde W.	IIIB	" "
Riordan, Julia B.	IVA	" "
Roesler, Alfred	IIIa	Lawrence, "
Rokes, Walter E.	VIb	Lowell, "
Rosencrantz, Wm. D., Jr.	Ia	" "
Rouine, Francis E.	VIb	" "
Roy, Wm. H.	Ia	" "
Sanson, James A.	VIb	North Billerica, "
Seifert, Edgar F. K.	IVA	Lawrence, "
Sherman, Charles R.	VIA	Haverhill, "
Simpson, Edwin P.	VIA	North Billerica, "
Smith, Hartman F.	IIB	South Lawrence, "
Smith, Leonard	VIA	Methuen, "
Soule, Wm. N.	VIId	Lowell, "
Steere, Samuel A.	IIIa	" "
St. Laurent, George	VIb	Lawrence, "
Sullivan, Michael F.	VIA	Dracut, "
Towler, William	IIIa	Lawrence, "
Turner, Roscoe C.	IIB	Lowell, "
Wainwright, Harold	IVA	Lawrence, "
Walworth, Walter F.	VIb	Lowell, "
Ward, Wm. H.	IIIa	" "
Weigel, Frederick A.	VIA	Lawrence, "
Wikstrom, James E.	VIId	Lowell, "
Williams, Allen R.	IIIa	" "
Willmott, Herbert J.	VIA	" "
Wood, Wm. H.	VIb	" "

First Year

Abbott, Arthur G.	Vb	Lawrence, Mass.
Abbott, George E.	IIB	" "
Adam, Isaac	IIIB	North Andover, "

Name	Course	Address
Alexander, Charles H., Jr.	Ia	Lowell, Mass.
Alexander, Leon H.	VIa	" "
Allen, Wm. J.	IVb	Lawrence, "
Anderson, James	VIa	" "
Anderson, Joshua	VIId	Lowell, "
Anderston, Harry	Vb	" "
Andrews, Anthony A.	VIa	" "
Andrews, John	IIIB	" "
Androutopoulos, Anthony E.	VIb	" "
Apollonio, Theron	Ia	" "
Arnfield, Earl A.	VIb	Lawrence, "
Arnold, Oscar W.	IIb	" "
Baldwin, George E.	VIa	Lowell, "
Baldwin, Richard M.	IIIA	" "
Ballinger, Raymond F.	VIb	North Chelmsford, "
Ballinger, Wm. F.	VIa-d	" "
Bamford, Frederick	VIb	Lowell, "
Bannister, Frank	VIb	" "
Barnes, Hammond	Ia-IIIA	" "
Barnes, Merritt H.	VIb-d	Danvers, "
Barry, Worthington	VIa	Lowell, "
Barton, Charles W.	VIa	" "
Baxter, John J.	VIb	" "
Bassett, Cyrus J.	Vb	" "
Baybutt, Raymond	IVa	Lawrence, "
Beaudry, Joseph A.	VIa	Lowell, "
Bedell, Henry B.	IIb	North Andover, "
Belleville, George	VIa	Lowell, "
Bergner, Walter F.	VIa	Lawrence, "
Berry, Paul	VIb	Lowell, "
Bigelow, Harold L.	VIa	" "
Billings, Clifford W.	VIa	Lawrence, "
Birdsall, Ernest	IIb	" "
Birdsall, George W.	IIb	" "
Bixby, Edward E.	VIe	Lowell, "
Bixby, Joseph C.	VIa	" "
Black, Alexander S.	Vb	Lawrence, "
Black, Wm. A.	IIa	Lowell, "
Blackwell, Irving C.	IIb	Lawrence, "
Bloomberg, Max M.	IVe	Chelsea, "
Bordeleau, George A.	IIIB	Lowell, "
Boulard, Armand	IIIB	" "
Boulger, Arthur	VIa	" "
Bourgeault, Wm.	IIIB	" "
Bowen, James J.	Ia	" "
Boyle, John E.	VIa	" "
Bradley, Chester J.	VIa	" "
Bradley, Henry T.	VIa	" "
Bradley, James F.	Vc	" "
Brady, Edward P.	IVa	" "
Branch, Guy E.	IIb	Lawrence, "
Breen, James D.	Vc	Lowell, "
Breen, John P.	Vb	" "
Brennan, Albert J.	VIb	" "
Briere, Andrew	VIa	" "
Brierly, James	IIIA	North Andover, "

Name	Course	Address
Briggs, Harry C.	IIIa	Lowell, Mass.
Brown, Harold A.	IIIa-Vb	" "
Browne, Charles D.	IIIa	" "
Brunelle, Oliver J.	VIa	" "
Burch, Lawrence V.	VIb	" "
Burdin, Wm. M.	IIb	North Andover, "
Burke, John J.	IVa	Lowell, "
Burns, James J.	VIa	" "
Burns, Matthew D.	VIa	Lawrence, "
Burnside, Edward W.	VIe	Lowell, "
Burton, Richard	IVa	" "
Butland, Ralph A.	IIb-VII	Lawrence, "
Buzzell, Fred S.	VII	Methuen, "
Cadarette, Albert P.	VIa	Lawrence, "
Cahill, Thomas	VIa	Lowell, "
Cairns, Robert J.	VIb	" "
Callahan, Frank W.	IVa	" "
Callahan, James J.	Va	" "
Callahan, John C.	VIa	Lawrence, "
Campbell, Alexander	VIa-e	Lowell, "
Campbell, Charles F.	IIIb	" "
Campbell, Edward G.	VIe	" "
Campbell, Frank J.	VIb	" "
Campbell, Thomas J.	IIIb	" "
Casavant, Elphege H.	VIa	Lawrence, "
Casey, Wm. F.	IIIa	Lowell, "
Cates, Howard L.	IVa	Andover, "
Caveney, William	Vc	Lowell, "
Caverly, Harvard M.	VIa	Dracut, "
Caza, Dorothy	IIIb	Lowell, "
Champagne, Mozart	IIIb	" "
Chase, Laurence J.	Vc	" "
Cherry, Adelaide P.	IIIb	" "
Chevalier, Edward	IIIb	" "
Christenson, John O.	IIIb	" "
Church, Hollis H.	IVa	" "
Cinqmars, Adelaar D.	VIa	" "
Clark, John H.	IVa	Lawrence, "
Classon, Walter H.	Vc	Nashua, N. H.
Clough, Ernest C.	VIb	Lowell, Mass.
Cochrane, William	IVa	" "
Collins, Frank J.	IIIa	" "
Collins, George A.	IVa	" "
Collins, John C.	VIa	" "
Comerford, Charles J.	VIb	" "
Condon, Michael J.	Vb	" "
Condrey, Joseph D.	IVa	" "
Conley, Leander F., Jr.	VIe	" "
Cook, Alfred C.	VIa	" "
Cook, Maxwell A.	VIa	" "
Cooper, George H.	Ia	" "
Coster, Thomas J.	IVa	" "
Cote, George W.	VIe	" "
Crompton, Arthur H.	VIa	Lawrence, "
Crompton, George E.	IVa	Lowell, "
Crowley, Daniel	VIa	" "

Name	Course	Address
Crumbie, Charles	I Ib	Lowell, Mass.
Cumming, Ernest G.	VIa	" "
Curran, John	Ia	" "
Daigle, Richard H.	VIa	" "
Dapontes, Walter	IIIb	" "
Daskalakis, Efthimios	IIIa-Vc	" "
Davidson, Robert J.	IIIa	" "
Davidson, Wm. L.	IVa	" "
Delderfield, John W.	VI d	" "
DeLoria, John A.	VIe	" "
Demers, Adolphe	VIa	" "
Demers, Aime	Vc	" "
Dick, Henry K.	VIa	" "
Doherty, Margaret S.	IIIa	" "
Doherty, Ruth M.	IIIa	" "
Dolan, James F.	VIa	" "
Donahue, Edward J.	VIa	Methuen, "
Donahue, Wm. E.	VIa	Lowell, "
Donahue, Wm. H.	IIIa	" "
Doole, James E.	IVa	" "
Downing, Esther M.	Ia	" "
Downs, John	VIa	" "
Driver, Frederick W.	IIa	North Andover, "
Duffy, Thomas	IIIa	Lawrence, "
Dumais, Marie L.	IIIb	Lowell, "
Dyer, Frederic	VI d	" "
Eagle, Robert W. F.	IIa	Andover, "
Early, Wm. E.	VIe	Lowell, "
Eastwood, Harold E.	IVa	" "
Ecclestone, Arthur G.	VI b	" "
Edmans, Harold J.	VII	" "
Edson, George F.	VII	" "
Egan, Charles H.	IVc	South Boston, "
Emmons, Harry I.	IVa	Lawrence, "
Erbe, William	IVa	" "
Erlebach, Carl	IVa	Lowell, "
Fagan, Thomas M.	VIa	" "
Farrisey, Charles A.	I Ib	Lawrence, "
Feather, James L.	VIa	" "
Feeney, John F.	IIb-VIe	Lowell, "
Fernley, Bert L.	VIa	" "
Finlayson, Robert T.	IIIa-Vb	" "
Fish, Samuel L.	VIa	" "
Flanagan, John S., Jr.	I Ib	" "
Flanders, George A.	Ia-VIe	" "
Fleming, Joseph A.	IVa	" "
Fleming, Wm. F.	I Ib	" "
Flint, Oliver S.	VIe	" "
Flynn, John J.	Ib	Roxbury, "
Ford, Austin L.	VIe	Lowell, "
Ford, Joseph L.	IIIa	Lawrence, "
Forster, Walter H.	IVa	Lowell, "
Fournier, Antonio	VIa	" "
Fox, Leo F.	IIIb	" "
Fox, Russell M.	IIIa	" "
Fraas, Alvin	Vb	Lawrence, "

Name	Course	Address
France, Albert	VIa	Lowell, Mass.
Freedman, Isidor H.	IVa	" "
French, George W., Jr.	IIIa	Lawrence, "
Fyfe, Fred A.	VIIb	" "
Gagnon, Leo	VIa	Lowell, "
Gallagher, Thomas J.	VII	Lawrence, "
Garson, Harold	IIIa	Lowell, "
Gaudette, Hector L.	IIa	" "
Gavin, John A.	Ia	" "
George, Arthur W.	IIb	Lawrence, "
Giffin, Ralph S.	IIIa	Lowell, "
Gilbride, James H.	VIa	" "
Gilfillan, John H.	Vb	" "
Gill, John T.	VIa	" "
Gilligan, Thomas A.	Vb	" "
Ginsburg, Albert	VIe	" "
Godair, Joseph J.	IIIa	Boston, "
Goddard, Harold	VIIb	Methuen, "
Golding, Thomas F.	IIb	Lowell, "
Goodrich, Byron M.	IIb	Methuen, "
Goodwin, Wm. C.	VIa	Lowell, "
Grand, Charles B.	Ib	" "
Graves, John F.	VIe	" "
Gray, Arthur C.	IIIa	Lawrence, "
Green, John H.	IIb	Lowell, "
Green, Ralph W.	IVa	" "
Green, Robert J.	VIIb-VIe	" "
Greenwood, Edgar	VIa	" "
Greenwood, Ralph F.	IIIa	Lawrence, "
Grigway, Charles H.	VII	Lowell, "
Grouke, Thomas A.	VIa	" "
Guilbault, George	Va	" "
Gunther, Edmund H.	VIa	Dracut, "
Gustafson, Alfred L.	VIa-VIIb-VIe	Lowell, "
Haggerty, Francis J.	VIa	" "
Haigh, Wm. T.	IIb	Methuen, "
Haithwaite, Albert	Ia	Lowell, "
Hall, Edward C.	IIIa	" "
Hall, Sydney H.	VIIb	" "
Halloran, George D.	VIa	" "
Halloran, Joseph M.	IIIa	" "
Hammond, John N.	Vb	North Andover, "
Hansbury, Andrew J.	VIIb	Lowell, "
Hanson, Victor G.	VIIb	Graniteville, "
Harrison, Claude	Va	Lowell, "
Harrison, Raymond R.	VIa	" "
Hart, Arthur A.	VIIb	" "
Hartt, Frank H.	VIIb	" "
Hartley, Ralph F.	IVa	Winchester, "
Hartnett, Michael J.	IVa	Lawrence, "
Hartwell, George K.	Ia	Lowell, "
Harvey, Guy	VIa	" "
Harvey, Wendell P.	VIe	" "
Hashmatian, Harry	IIIb	" "
Haslam, Albert H.	Ia	" "
Hazling, Harry	VIa	" "

Name	Course	Address
Healey, Harry W.	VIa	Lowell, Mass.
Healey, Andrew J.	VIa	" "
Heath, Thomas A.	VIb	" "
Heavey, Thomas J.	IVa	Tewksbury, "
Hebert, George	VIa	Lowell, "
Hendricks, Thomas A.	VIa	" "
Hessian, Thomas	VId	" "
Hibbert, George E.	IIIa	" "
Hickey, Albert W.	IIb	" "
Hickson, Henry F.	IVa	" "
Hill, Merle H.	VIa	" "
Hill, Robert W.	IVa	Andover, "
Hilliard, Wm. B.	I Va	Lowell, "
Hinckley, Daniel W.	Ia	" "
Hindle, Leo	IIIa	" "
Hird, Guy E.	VIb	" "
Hoffman, George H.	Ia-VIe	" "
Holmes, Mary M.	IIIa	" "
Horne, Frank B.	IIb	Lawrence, "
Horner, Ellis	IIb	" "
Hosmer, Charles A.	Ia	Lowell, "
Houghton, Roland G.	VIe	" "
Howard, Alden B.	IIb	" "
Howard, Herbert J.	VIe	" "
Howe, Charles W., Jr.	VId	" "
Hunt, Guy C.	Ia	" "
Hunter, Peter W.	Vb	" "
Hutton, Thomas V.	VIb	" "
Inch, Thomas S.	Vb	Collinsville, "
Innes, Andrew K.	Vb	Lawrence, "
Izay, George J.	IIIa	" "
Jackson, George T.	VIb	North Andover, "
James, Bernard	Ia	Lowell, "
Jarvis, Charles	Vb	Andover, "
Jasper, Grant A.	VId	Lowell, "
Jenkins, Harry E.	IVa-VIe	" "
Jenny, Dietrich	IIIa-Va	" "
Johnson, Arthur O.	IVa	Lawrence, "
Johnson, Wilbur S.	IVa	Lowell, "
Johnston, Thomas	VIa	" "
Jones, Frank H.	VIa-VIe	" "
Jones, Joseph L.	VIa	" "
Jordan, Frederic W.	VIe	" "
Kelley, Herbert G.	VIa	" "
Kelley, Joseph P.	VId	" "
Kelly, Timothy J.	Vb	" "
Kent, Arthur	VIa-d	" "
Kerrigan, Arthur J.	VIe	" "
Kershaw, Samuel S.	Vb	North Chelmsford, "
Kidd, Thomas E.	IVd	Lowell, "
Kiernan, Thomas A.	VId	" "
Kiley, George T.	VIa	South Lawrence, "
Kimball, Alvion D.	IIb	Lawrence, "
King, Edmund F.	Vb	Lowell, "
King, John M.	VIa-b-e	" "
Kirby, Donald T.	VIe	" "

Name	Course	Address
Kirkpatrick, Albert A.	IIIa	Lowell, Mass.
Kirkpatrick, Lloyd A.	Ia	" "
Kittredge, Luther R.	VIa	" "
Kydd, Norman	VIb	" "
Kyle, George S.	IVa	" "
LaBrecque, Joseph M.	VIa	" "
Lake, Eben H.	VIa	North Andover, "
Lalime, Charles E.	Ia	Lowell, "
Lang, Wm. A.	Vc-VIe	" "
Lannan, Joseph D., Jr.	VIa	" "
Lapointe, Joseph H.	IIIb	" "
Laporte, Philip J.	IVc	" "
Laprise, Frank E.	IVa	" "
Lasuer, Harrison L.	IVa	Lawrence, "
Laughlin, Edwin T.	Ia	Lowell, "
Laurin, Erick T. L.	VIb	" "
Laurin, George W.	VIa	" "
Laven, Theodore	IIa	" "
LaVigne, Andre	VIe	" "
Lawson, Ralph	Ia	" "
Laycock, Berry	IIIa	" "
Learned, Frank E.	Va	Methuen, "
Leather, Seward S.	IIb	Lawrence, "
Leavitt, John F.	VIa	Lowell, "
Ledoux, Paul E.	VIa	" "
Lees, Wm. H.	IIIa	" "
Leggett, Dan A.	VIb-e	" "
Leland, Raymond C.	VIb	" "
Leonard, Charles W.	VII	" "
Leonedes, Louis	Va	" "
L'Heureux, Sylvester A.	VIa	" "
Linehan, Thomas W.	IIb	Lawrence, "
Lowe, Harry F.	Va	Lowell, "
Luce, Harry A.	IIIa	" "
Ludwig, Samuel W.	VIa	" "
Lussier, Arthur J.	VIa	" "
Lynch, Arthur	IIIb	" "
Lynch, Cornelius F.	IIb	" "
Lyons, John A.	VIa	" "
McCann, Frank J.	VIb	" "
McCann, James P.	VIb	" "
McCarthy, Charles	VIa	Andover, "
McCarthy, Charles J.	VIId	Lowell, "
McCarthy, Joseph C.	IVa	Lawrence, "
McCarthy, Olin	VIa	Andover, "
McCartin, Marietta L.	IIIa	Lowell, "
McCreery, Robert W.	Ia	" "
McCusker, John E.	VIa	" "
McDermott, Wm. G.	VIa	Andover, "
McDonald, Odber M.	VIa	Dracut, "
McDonough, John W.	IVa	Lowell, "
McDonough, Martin F.	VIa	Lawrence, "
McElroy, Claude R.	VIId	Lowell, "
MacElroy, John T.	VIb	" "
McGowan, Annie C.	IIIa	" "
McGowan, John P.	IVa	" "

Name	Course	Address
McKinley, Burt O.	IIa	Lowell, Mass.
McKittrick, Percy A.	VIa	" "
McLaren, Thomas	VIa-VIe	" "
McMahon, Daniel	VIb	" "
McParland, James J.	VIa	" "
McQuade, Thomas H.	VIa-d	" "
McQuaide, James C.	IIb	" "
MacVey, Paul K.	Ia	" "
Maguire, Andrew F.	Vb	" "
Mailloux, Hector J.	VIa	" "
Marsden, Fred	IIIa	Lawrence, "
Marsh, Herbert	IVa	Lowell, "
Marshall, Wm. J. J.	VIa	" "
Matthews, Alexander	VIa	" "
Maynard, Wilfred B.	VII	" "
Mayo, Archibald J.	VIa	Andover, "
Mears, Edward C.	VIa	North Billerica, "
Mears, Lewis N.	IVa	Ballardvale, "
Meehan, Wm. F.	VIa	Lowell, "
Merry, Ross J.	IIIa	Lawrence, "
Messenger, George A.	VIe	Lowell, "
Michaud, Joseph E.	VIa	" "
Midgley, Samuel	Va	" "
Miller, Ernest P., Jr.	Ib	" "
Miller, Severn A.	IIa	" "
Milot, Joseph E.	VIe	" "
Mitchell, Charles B.	VIe	" "
Mitchell, Wm. H.	IIIa	" "
Moir, Malcolm A.	IIb	" "
Moir, Robert F.	VIa	" "
Molloy, Frank B.	Va	" "
Molloy, Michael A.	VIa	" "
Moloney, John F.	IVa	Lawrence, "
Montbleau, Romeo R.	IIIb	Lowell, "
Moore, George C., Jr.	IIa	North Chelmsford, "
Moriarty, John M.	VIa	Lowell, "
Moss, Louis G.	Vb	" "
Mowatt, John	VIa	" "
Muldoon, Wm. L.	Vb	" "
Mullen, Albert R.	Ia	" "
Mullen, Francis J.	VIa	" "
Mulvey, Fred J.	Vb	" "
Murphy, Frank	IIIa	" "
Murphy, Hugh J.	VIa	" "
Murphy, Leo T.	Vc	" "
Murphy, Michael W.	Vb	" "
Murphy, Wm. H.	VIe	" "
Murray, Marion S.	IVa	Lawrence, "
Musard, Albert E., Jr.	Vb	Lowell, "
Musard, Henry A.	Vc	" "
Naud, Marie A.	IIIb	" "
Naylor, Charles	IVc	" "
Neckou, James	VIa	" "
Nelson, Charles J.	IIb	" "
Nelson, Ernest H.	Ib	" "
Noonan, James J.	VIa-VIe	" "

Name	Course	Address
Normandy, Joseph M.	VIa	Lowell, Mass.
Nugent, Christopher C.	IIIa	" "
Nystrom, Urno A.	IIIa	" "
O'Brien, Frederic A.	VIa	" "
O'Brien, Joseph P.	VIa	" "
O'Brien, Raymond L.	IVa	Lawrence, "
O'Brien, Wm. H.	Vb	Lowell, "
Ogden, Frank	IIIa	" "
Olson, Oscar	VII	" "
O'Neil, Walter E.	VIIb	North Chelmsford, "
Orrell, Frank L.	Vb	Lowell, "
Ortel, Charles, Jr.	VIa	" "
Palm, Carl H.	IIIa	" "
Paquette, Donat N.	Ia	" "
Parent, George	VIa	" "
Payton, James J.	IIb	Lawrence, "
Pearce, Frank J.	IVa	Lowell, "
Pearson, John	VIa	" "
Peck, Carroll W.	IIb	" "
Perlman, Samuel	VIb	" "
Perron, Francis J.	IIIa	North Andover, "
Peterson, Erick W. L.	VIa	Lowell, "
Pickup, John H.	IVa	" "
Pierce, Gordon J.	IIIa	" "
Pihl, Mansfred M.	VIb	" "
Pilkington, Harry L.	Ia-VIc	" "
Pinkham, Banford O.	VIa	Andover, "
Place, Richard E.	Va	Lowell, "
Playdon, Louis C.	Ia	Lawrence, "
Plumer, Paul T.	IIIa	Lowell, "
Poore, Ralph C.	VIa	Lawrence, "
Porter, Clarence M.	IIIb	North Andover, "
Porter, Wm. E.	VIa	Lowell, "
Potter, Allan B.	VIb	" "
Powers, James	Ia	" "
Preble, George	Vb-c	" "
Putnam, George I.	VIc	" "
Quinlan, Paul A.	IIIb	" "
Quinn, James H.	VII	Lawrence, "
Racicot, Marie E.	IIIa	Lowell, "
Reardon, Timothy H., Jr.	VIa	" "
Redman, Arthur E.	VIc	" "
Redman, Henry S.	Ib-VIc	" "
Redpath, Robert H.	VII	Lawrence, "
Regan, John T.	Vc	Lowell, "
Reynolds, James J.	Vc	" "
Reynolds, James W.	IIIa	" "
Rice, Henry H.	Ia	" "
Richardson, George F.	Vb	" "
Rigley, Katherine A.	IIIb	" "
Riley, James F.	VIa	" "
Robertson, George O.	IVa	" "
Robinson, George	Vb	" "
Rockwell, Webster	VIa	" "
Rokes, Walter E.	VIb	" "
Rosencrantz, Wm. D., Jr.	Ia	" "

Name	Course	Address
Ross, George M.	Ia	Lowell, Mass.
Rourke, Daniel	VIa	" "
Roussell, Henry	VIb	" "
Roy, Wm. H.	Ia	" "
Ryan, Matthew A.	VIa	" "
Ryan, Wm. F.	VIa	" "
Sabine, George K., Jr.	Ia	Brookline, "
Sanborn, Ralph L.	VIe	Lowell, "
Sampson, Lorin B.	IIIa	" "
Saucier, Alma	IIIa	" "
Savage, Charles F.	IVc	" "
Scanlon, Genevieve B.	IIIb	Lawrence, "
Schnell, Joseph T.	VIa	Lowell, "
Scobie, Percy	VIa	" "
Scully, Patrick F.	IIIa	" "
Shaffer, Wm. A.	VIa	" "
Sharpe, Frederick A.	IVa	Methuen, "
Shea, James T.	IVa	Lowell, "
Shearer, David D.	Vb	Lawrence, "
Shirreffs, John S.	IIIa	North Chelmsford, "
Simmers, Blanche J.	IIIb	Lawrence, "
Simmers, Wm. A.	VIa	Dracut, "
Singleton, James J.	VId	Lowell, "
Skidmore, Russell P.	VIe	" "
Sleeper, Robert R.	VII	" "
Small, Jason	IIa	North Andover, "
Smith, Mae	IIIb	Lowell, "
Smith, Miles H.	IIb	Lawrence, "
Smith, Rothwell E.	VIe	Lowell, "
Sokolsky, Henry	VIb	" "
Southwart, Herbert	IIIa	" "
Sparks, Charles G.	VIa	" "
Speed, Joseph	IIb	Lawrence, "
Spillane, Wm. J.	VId	Lowell, "
Stahl, Milton C.	IIb	Lawrence, "
Staples, Lester E.	IIIb	Lowell, "
Steere, Samuel A.	IIIa	" "
Stephens, Paul S.	VIe	" "
Stevenson, Robert P.	IIIa	" "
Stites, Burton C.	VIb	" "
Stokham, Ernest F.	IVa	" "
Stone, Homer	IIIb	" "
Strong, Alexander	Ia	" "
Sugden, Albert G.	VII	" "
Sullivan, Augustine	VIa	Andover, "
Sullivan, Patrick F.	VII	Dracut, "
Summersby, Wm. C.	VIe	Lowell, "
Sussman, Joseph A.	VIe	" "
Swain, Asa W.	VIb	North Chelmsford, "
Swain, Robert F.	IIb	" "
Swallow, Oscar S.	VIb	Lowell, "
Swanson, Victor E.	VId	" "
Swanson, Victor E.	IVb	" "
Swift, John W.	IIb	" "
Sykes, Edgar W.	VIa	Collinsville, "
Sykes, Richard C., Jr.	IIb	Lowell, "

Name	Course	Address
Tautenhalm, Curt E., Jr.	IIIa	Lawrence, Mass.
Taylor, Ernest H.	VIa-VIe	Lowell, "
Terry, Ralph W.	VIIb	" "
Thibault, Henry	Ia	" "
Tighe, George F.	VIa	" "
Tolchard, Charles F.	IIIa	Lawrence, "
Torris, John A.	VIIb	" "
Tottle, Albert E.	IIIb	Lowell, "
Toye, Lewis S.	VIIb	Dracut, "
Tremblay, Joseph	IIIa	Lowell, "
Trudel, Joseph H.	IIIb	" "
Tryon, Royal	VIa	" "
Tucke, Edward D.	VIa	" "
Tully, Daniel F. J.	IVa	" "
Turgeon, Roderick	IVc	" "
Turner, Amos S.	VId	" "
Turner, Channing	Ib	" "
Turner, Roscoe C.	IIIb	" "
Turner, Royal	IIIb	Lawrence, "
Twomy, Hugh	VId	Lowell, "
Valpey, Frank D. R.	IIIa	Lawrence, "
Vaughan, Edward A.	VIa	Lowell, "
Veillette, Arthur	VIIb	" "
Waldron, Augustine T.	VII	Lawrence, "
Walen, Ernest D.	Ib	Lowell, "
Wallis, Joseph	VIIb	" "
Watson, Wm. J.	VIa	" "
Webster, Orrin H.	IIIa	" "
Weinhold, Wm.	IIIa	Methuen, "
Welcome, Eugene	VIa	Lawrence, "
Welcome, Harold A.	VIa	Lowell, "
Weller, Richard H.	IIIa	Lawrence, "
Wells, Frank H.	VIe	Lowell, "
Welsh, George	VIa	" "
Wessen, Carl E.	Vc	" "
Whitley, Arthur M.	IIIb	" "
Wiggins, John R.	IIIa-Va	" "
Wilbur, Earl R.	Vb	" "
Wilfore, John E.	VIIb	" "
Wilkinson, Joseph	VII	" "
Wilkinson, Wm. L.	IIIb	Lawrence, "
Williams, Allen R.	Vc	Lowell, "
Willis, Percy L.	IIIa	" "
Willmott, Alice E.	IIIb	" "
Willmott, Herbert J.	VIe	" "
Winslow, Herbert S.	IIa	" "
Wirt, Edward R.	IIIa	" "
Wolf, Wm. C.	IIIa	Lawrence, "
Wood, Albert I.	VIa	Lowell, "
Wood, James	Ia	" "
Wood, Leslie E.	VIa	" "
Wood, Samuel	Ia	" "
Woods, Harvey A.	VIe	" "
Worth, Harold G.	IIIa-Vc	" "
Yerry, Charles	Ia	" "

SUMMARY

Day Students	134
Evening Students	746
Total	880
Names counted twice	56
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ALPHABETICAL REGISTER OF GRADUATES

Name	Course	Class	Day or Evening
Abbott, Edward M.	II	1904	D
Abbott, George R.	II	1908	D
Abbott, Paul W.	Ia	1906	E
Ackroyd, Theodore C.	IIb	1907	E
Adams, Henry S.	IIa	1903	E
Adams, Henry S.	I	1905	D
Adams, Michael E.	VI	1904	E
Adams, Tracy A.	IV	1911	D
Adams, William R.	IIa	1902	E
Amiot, Louis H.	Va	1906	E
Anderson, Carl A.	IV	1909	E
Anderton, Harry	Va	1910	E
Andrews, Oliver	Ia-Va	1911	E
Arienti, Peter J.	IV	1910	D
Armstrong, Elias B.	IIb	1906	E
Arnold, Warren H.	VII	1908	E
Arnold, Warren H.	IIIa	1909	E
Arundale, Henry B.	II-III-V	1905	D
Arundale, Henry B.	II	1907	D
Aspinwall, William	IIb	1901	E
Atkinson, Norman	Vb	1910	E
Avery, Charles H.	II	1906	D
Bailey, Carl E.	Ia	1910	E
Bailey, Joseph W.	I	1899	D
Bailey, Rothwell	Va	1909	E
Bailey, Walter J.	IV	1911	D
Bain, William A.	VII	1907	E
Bake, Herbert	IIIa	1905	E
Bake, Herbert	P. G. IIIa	1906	E
Bake, Herbert	VII	1907	E
Bake, Herbert	P. G. IIIa	1909	E
Baldwin, Arthur L.	IV	1900	D
Baldwin, Frederick A.	II	1904	D
Ballard, Horace W. C. S.	IV	1908	D
Ballinger, Frederick W.	IIb	1907	E
Ballinger, William E.	IIb	1911	E
Balmforth, James H.	IIa	1903	E
Balmforth, James H.	IIa-b	1904	E
Balmforth, William F.	VI	1904	E
Balmforth, Martha B. (See French)			
Banks, Jonas	Va	1909	E
Banks, Jonas	Vc	1910	E
Barber, James E.	IIb	1907	E
Barker, John P.	V	1904	E
Barlow, Robert	V	1902	E
Barnes, Joseph	Ia	1911	E
Barr, Elizabeth Butler	IIIb	1909	E
Barr, I. Walwin	I	1900	D
Barraclough, John C.	Ia	1907	E
Barrington, James L.	IV	1908	E
Barrington, John A.	IV	1904	E
Barry, Edward J.	IIIa	1903	E
Bastow, Henry	IIIa	1903	E
Bastow, Henry	V	1905	E

Name	Course	Class	Day or Evening
Bastow, Percy	IVa	1911	E
Bastow, Stephen W.	IV	1907	E
Baxter, Alvah J.	IIa	1903	E
Bayard, Pierre P.	IIIIa	1907	E
Beech, Wilfred	Ia	1912	E
Begen, Thomas W.	IIb	1907	E
Begen, Thomas W.	IIb	1908	E
Bell, Frederick W.	IIa	1905	E
Bennett, Edward H.	V	1903	D
Benoit, Benjamin L.	VIIb	1909	E
Benoit, William A.	Va	1907	E
Bernard, Joseph E.	VId	1912	E
Berry, Alfred H.	VI	1908	E
*Berry, Frank M.	IIIIa	1899	E
*Berry, Frank M.	V	1901	E
Berry, Percy W.	Vb	1910	E
Bigelow, Prescott F.	II	1912	D
Binns, Heaton	II-V	1899	E
Binns, Heaton	VI	1902	E
Birkby, Charles H.	IVa	1911	E
Blaikie, Howard M.	II	1911	D
Blais, Emile	VId	1912	E
Blanchette, Eugene	IIIIb	1912	E
Bloom, Wilfred N.	IV	1903	D
Bodwell, Henry A.	II	1900	D
Boije, Walter F.	IIb-VII	1912	E
Booth, Arthur	IIIIa	1909	E
Boucher, John L.	VI	1904	E
Bouille, Arthur L.	Vb	1907	E
Bourchard, Ethan J.	Vc	1910	E
Bourchard, Robert R.	Vb	1910	E
Bowen, Herbert E.	IIIIa	1909	E
Bowie, Samuel A.	VI	1905	E
Bowring, George P. B.	VI	1902	E
Boyd, George A.	I	1905	D
Bradford, Roy H.	II	1906	D
Bradley, Richard H.	V	1901	D
Brainerd, Albert C.	Ia	1912	E
Brainerd, Arthur T.	IV	1909	D
Brainerd, Harry C.	Ia	1912	E
Brainerd, Irving L.	Ia	1902	E
Bramley, Charles	Va	1912	E
Brannen, Leon V.	IIII-V	1907	D
Brannen, Leon V.	IIa	1907	E
Brickett, Chauncey J.	II	1900	D
Broadbent, James H.	Vb	1908	E
Broadbent, James T.	Ia	1899	E
Broadbent, William	Vb	1908	E
Broderick, Thomas H.	VII	1912	E
Brooks, Noah	IIIIa-V	1901	E
Brouder, John J.	IIIIa	1906	E
Brouder, John J.	VII	1907	E
Brown, James P.	IIIIa	1905	E
Brown, James P.	P. G. IIIIa	1906	E
Brown, James T.	IIIIa	1908	E

*Deceased

Name	Course	Class	Day or Evening
Brown, Rollins	IV	1912	D
Brown, William F.	VIb	1911	E
Brown, William G.	IIb	1906	E
Browne, Charles D.	Ia	1912	E
Bryant, Ernest L.	VI	1905	E
Buchan, Donald C.	II	1901	D
Buckley, Harry	IV	1908	E
Buckley, Richard A.	Vb	1909	E
Bucklitsch, Gustave J.	IIb	1907	E
Bunce, Raymond H.	Vb	1909	E
Burgess, Joseph H.	Va	1906	E
Burgess, Joseph H.	Vb	1907	E
Burgess, Joseph H.	IIIa	1910	E
Burghardt, Edward S.	IIa	1902	E
Burghardt, Paul C.	IIa	1901	E
Burke, George J.	VII	1912	E
Burke, James F.	Vc	1911	E
Burke, Thomas F.	Ia	1905	E
Burnham, Frank E.	IV	1902	D
Burnham, Joseph W.	IIIa	1906	E
Burnham, Wilmont V.	Vb	1906	E
Burns, Edward J.	IV	1905	E
Burns, James E.	IV	1905	E
Burrage, Katherine C.	IIIb	1899	D
Burrage, Katherine C.	P. G. IIIb	1900	D
Butler, Benjamin O.	VI	1904	E
Butler, Elizabeth M. (See Barr)			
Butterworth, Charles A.	Va	1907	E
Butterworth, John A.	IIb	1907	E
Buzzell, Fred S.	IIIa	1912	E
Buzzell, William O.	IIIa	1901	E
Buzzell, William O.	P. G. IIIa	1902	E
Byam, Walter S.	VI	1903	E
Cady, Dennis J.	V	1903	E
Callahan, Patrick A.	VI	1904	E
Cameron, Elliott F.	IV	1911	D
Campbell, Albert D.	IIb	1900	E
Campbell, Archibald	IV	1908	E
Campbell, Edward G.	VIc	1910	E
Campbell, Laura E.	IIIb	1900	D
Campbell, Louise P.	IIIb	1903	D
Campbell, Orison S.	II	1903	D
Carden, Francis E.	IIb	1907	E
Carden, Francis E.	IIb	1908	E
Carlson, Ernest B.	IIb	1907	E
Carlson, Goddard O.	VII	1912	E
Carman, William	Va	1909	E
Carney, William J.	Ia	1908	E
Caron, Cleophas	Ia	1905	E
Carpilio, John A.	VIa	1911	E
Carr, George E.	I	1905	D
Carter, Charles R.	Vb	1908	E
Carter, Robert A.	IV	1902	D
Carty, Thomas P.	Vb	1911	E
Cary, Julian C.	VI	1910	D
Cawthra, Albert B.	IIb	1900	E

Name	Course	Class	Day or Evening
Chamberlin, Frederick E.	I	1903	D
Chandler, Proctor R.	IV	1911	D
Cheetham, John James	IIIa	1901	E
Cheetham, John James	P. G. IIIa	1902	E
Cheetham, John Joseph	Ia	1904	E
Chesworth, Frank K.	Va	1909	E
Chippindale, Ernest W.	IIb	1901	E
Chisholm, Lester B.	I	1911	D
Christenson, John O.	VIIb	1912	E
Christison, Hugh	IV	1910	E
Christison, Hugh	IVd	1911	E
Church, Charles R.	II-V	1906	D
Churchill, Charles W.	III	1906	D
Clapp, F. Austin	II	1904	D
Clark, John W.	IVa	1912	E
Clark, Thomas T.	II	1910	D
Clogston, Raymond B.	IV	1904	D
Coan, Charles B.	IV	1912	D
Cochrane, John	VIIb	1911	E
Cockell, Frederick H.	IIIa	1909	E
Colby, Arthur D.	Ia	1900	E
Cole, Edward E.	IV	1906	D
Cole, James T.	II	1905	D
Collier, John	IIIa	1899	E
Collier, John	P. G. IIIa	1902	E
Collins, John A.	IIa-b	1905	E
Coman, James G.	I	1907	D
Conant, Harold W.	I	1909	D
Conant, Richard G.	I	1912	D
Conklin, Jennie G.	IIIb	1905	D
Conley, Frederick A.	VI	1904	E
Connors, Edward F.	VI	1904	E
Cook, Cheney E.	IIIa	1905	E
Corr, Eben W.	Vb	1908	E
Corr, James F.	Vb	1908	E
Cote, George W.	VIIb	1911	E
Cowdell, Herbert	V	1901	E
Cowdrey, Charles E.	V	1902	E
Cowdrey, Charles E.	Vb	1909	E
Cox, Edward J.	IIIa	1910	E
Cox, Edward J.	Va	1911	E
Craig, Albert W.	IV	1907	D
Craig, Clarence E.	III	1902	D
Craven, Harry	VII	1908	E
Cremin, Daniel J.	Ia	1902	E
Crompton, Henry H.	II	1899	E
Culver, Ralph F.	IV	1904	D
Curran, Charles E.	II-III-V	1902	D
Currier, Herbert A.	I	1906	D
Currier, John A.	II	1901	D
Curtis, Frank M.	I	1906	D
Curtis, William L.	II	1905	D
Custer, James J. E.	V	1905	E
Cutler, Benjamin W., Jr.	III	1904	D
Cutress, Albert J.	VId	1910	E
Cuttle, James H.	II	1899	D

Name	Course	Class	Day or Evening
Dalton, Gregory S.	IV	1912	D
Dana, Clarence A.	VI	1905	E
Daskalakis, Euthimios	Vb	1912	E
*Davis, Henry	11b	1901	E
Davis, Prentice T.	Ia	1904	E
Davison, Frank L.	Vb	1909	E
Dean, Hubert R.	VIb	1911	E
Dearth, Elmer E.	IV	1912	D
Deely, John A.	Vb	1910	E
Delaney, Michael J.	Vb	1911	E
Delmage, Edward R.	IIIa	1904	E
Dempsey, John W.	IIa	1904	E
Dewey, James F.	II	1904	D
Dewey, Maurice W.	II	1911	D
Dick, Henry K.	Ia	1912	E
Dick, Hugo P.	IIIa	1905	E
Dick, Hugo P.	P. G. IIIa	1906	E
Dick, Hugo P.	IIb	1907	E
Dick, Hugo P.	Vb	1908	E
Dickson, Andrew	IIa	1906	E
Dillon, James H.	III	1905	D
*Dimlick, Benjamin C.	IIIa	1905	E
*Dimlick, Benjamin C.	P. G. IIIa	1906	E
Dittman, Ralph A.	IIIa	1912	E
Dixon, Arthur	IIIa	1908	E
Dobbs, William	IIb	1907	E
Dobbs, William	IIb	1908	E
Dodge, Charles P.	IIa	1907	E
Dodge, Ernest W.	Vb	1911	E
Dodge, Frank	Ia	1906	E
Dollbaum, John A.	IIIa	1912	E
Donahay, William H.	Vb	1912	E
Donahue, Michael F.	VI	1904	E
Donald, Albert E.	II	1904	D
Donnellan, Frank T.	IIa	1902	E
Donnellan, Frank T.	V	1903	E
Donnelly, James	Ia	1900	E
Donovan, Daniel F.	IIa	1901	E
Doole, George L.	VI	1904	E
Dooley, Edward W.	VI	1904	E
Downs, John F.	VIId	1911	E
Duce, Benjamin	IIIa	1906	E
Duce, Benjamin	VII	1907	E
Duckett, Fred I.	Vb	1910	E
Dudley, George E.	Ia	1902	E
Duggan, Francis P.	VI	1904	E
Dulligan, Charles E.	VIa	1909	E
Dulligan, Charles E.	IVa	1912	E
Dulligan, Lawrence F.	VIa	1910	E
Dulligan, Thomas	VIa	1911	E
Dunn, George C.	IIIa	1908	E
Dunn, George C.	IVa	1910	E
Dunning, Carlos W.	VIb	1909	E
Duval, Joseph E.	II	1910	D
Dwight, John F., Jr.	II	1908	D

*Deceased

Name	Course	Class	Day or Evening
Egan, Charles H.	IVa	1912	E
Ehrenfried, Jacob B.	II-V	1907	D
Eklund, Louis V.	Vb	1910	E
Elliot, Gordon B.	II	1912	D
Ellis, George W.	VII	1906	E
Elston, Fred R.	IIIa	1900	E
Emerson, Frank W.	II	1903	D
Engstrom, Karl E.	VI	1912	D
Erbe, Gustave	VI	1905	E
Evans, Alfred W.	III	1903	D
Evans, William R.	III	1903	D
Evison, William A.	V	1901	E
Ewer, Nathaniel T.	IV	1901	D
Eyers, John T.	IV	1906	E
Fairbanks, Almonte H.	II	1909	D
Farmer, Chester J.	IV	1907	D
Farr, Leonard S.	II	1908	D
Farrell, Thomas	IIa	1901	E
Fels, August B.	II	1899	D
Ferguson, Arthur F.	I	1902	D
Ferguson, Arthur F.	I	1903	D
Ferguson, Thomas	V	1902	E
Ferguson, William G.	III	1909	D
Field, Charles W.	VI	1902	E
Fielding, Fred	Vc	1910	E
Finlay, Harry F.	IV	1910	D
Fiske, Starr H.	II	1909	D
Flaherty, William	Vb	1911	E
Fleming, Frank E.	IV	1906	D
Flemings, Lester A.	Va	1910	E
Fletcher, Roland H.	VI	1910	D
Flint, Leon G.	IIIa	1907	E
Flynn, John	VI	1910	E
Flynn, John J.	VI	1903	E
Flynn, Patrick	Vb	1910	E
Flynn, Thomas P.	IV	1911	D
Flynn, William J.	Vb	1908	E
Ford, Edgar R.	IV	1911	D
Forrest, Fred G.	IIa	1902	E
Fortune, David A.	IIb	1902	E
Foster, Clifford E.	II	1901	D
Foster, Sherwood L.	Ia	1905	E
Fournier, Albert A.	Ia	1911	E
Frame, William	V	1901	E
Frank, Emil M.	IIIa	1904	E
Frank, Emil M.	P. G. IIIa	1906	E
Frechette, Alphonse J.	IIb	1907	E
Freeman, Ralph W.	IVa	1912	E
French, Ernest J.	Ia	1905	E
French, Martha Balmforth	IIIa	1903	E
Frost, Harold B.	II	1912	D
Frothingham, Newton S.	Ia	1912	E
Fujiyoshi, Heisayu	Ia	1910	E
Fujiyoshi, Heisayu	Va	1911	E
Fuller, George	I	1903	D
Fulton, John M.	V	1906	E

Name	Course	Class	Day or Evening
Gagan, John H.	V	1901	E
Gahm, George L.	II	1906	D
Gainey, Francis W.	IV	1911	D
Gakidis, Alexander N.	IVa	1911	E
Gale, Harry L.	III	1910	D
Garner, William	IIIa	1903	E
Garrity, Joseph F.	VI	1911	E
Gaspar, Edith E.	IIIb	1910	E
Gaunt, Alfred C.	IIIa	1899	E
Gaunt, Alfred C.	P. G. IIIa	1902	E
Gaunt, Alfred C.	IIa	1903	E
Gaunt, Alfred C.	IIb	1904	E
Gaunt, Ernest H.	IIIa	1909	E
Gauthier, William	Vb	1910	E
Gay, Earle B.	Ia	1905	E
Gay, Olin D.	II	1908	D
Gerrish, Walter	III	1903	D
Gilinson, Philip J.	VIa	1909	E
Gillispie, James E.	VII	1907	E
Gillon, Sarah A.	IIIb	1906	D
Glennon, Edward M.	IVa	1911	E
Goldberg, George	VI	1910	D
Good, Henry	Ia	1902	E
Goodchild, George	Ia	1903	E
Goodchild, George	VI	1905	E
Goodhue, Amy H. (See Harrison)			
Goodwin, Ross	Vb	1911	E
Gookin, Alice L.	IIIb	1910	E
Gordon, Herbert E.	IIIa	1909	E
Grant, Archibald	IIb	1901	E
Graves, John F.	VIb	1912	E
Gray, Finley M.	VI	1903	E
Greenhalge, James	Vc	1908	E
Greenwood, Ralph F.	VII	1912	E
Gregson, Robert B.	Va	1906	E
Gregson, Robert B.	Ia-Vc	1907	E
Grouke, Michael	IIb	1901	E
Gustafson, Alfred L.	IVa	1911	E
Gyzander, Arne K.	IV	1909	D
Haartz, John C.	VII	1907	E
Haas, Ignatius	Ia	1907	E
Hadley, Walter E.	IV	1908	D
Haigh, Walter	IIIa	1902	E
Haigh, William	Vb	1906	E
Hallbauer, William R.	Vb	1908	E
Halsell, Elam R.	I-V	1904	D
Hamblett, Harry A.	Ia	1907	E
Handley, John M.	Vb	1911	E
Hanglin, Albert J.	IV	1907	E
Hanglin, William E.	Vb	1907	E
Hansen, Hans M.	VI	1912	E
Hanslip, Charles W.	Vb	1911	E
Hanson, Edward	IIIa	1908	E
Hanson, Edward	P. G. IIIa	1909	E
Harder, Elmer E.	VI	1905	E
Hardman, David B.	IV	1908	E

Name	Course	Class	Day or Evening
Hardy, Philip L.	VI	1910	D
Harmon, Charles F.	I	1899	D
Harris, Charles E.	I	1905	D
Harris, George S.	I	1902	D
Harris, Louis	VII	1908	E
Harrison, Amy Goodhue	IIIb	1900	D
Harrison, Amy Goodhue	P. G. IIIb	1901	D
Hartshorn, George T.	VII	1912	E
Hartwell, Henry E.	VI	1906	E
Hartwell, Marcus H.	Ia-Va	1911	E
Haskell, Spencer H.	II	1907	D
Haskell, Walter F.	IV	1902	D
Hassett, Paul J.	IV	1912	D
Hathorn, George W.	IV	1907	D
Haven, George W.	IIIa	1905	E
Haworth, Joseph	VI	1902	E
Hay, Ernest C.	II	1911	D
Hayes, Michael C.	IIa	1909	E
Heaton, Forster G.	IV	1911	E
Hebert, Charles L. J.	IV	1907	E
Hempel, Frank	V	1904	E
Hendrickson, Walter A.	II	1911	D
Hennessey, Ambrose M.	VII	1908	E
Hennigan, Arthur J.	II	1906	D
Hering, Paul C.	IIIa	1910	E
Herrick, William E.	VII	1911	E
Hibbert, George E.	Va	1910	E
Hibbert, George E.	Vc	1911	E
Hibbert, George E.	Vb	1912	E
Higgins, James A.	IIa	1903	E
Higgins, James A.	IIa-b	1904	E
Higginson, Joseph H.	IIIa	1912	E
Hildreth, Harold W.	II-V	1906	D
Hildreth, Harold W.	II	1907	D
Hill, Daniel	IIb	1901	E
Hill, Ellsworth O. C.	IIb	1910	E
Hill, Harold	Ia	1908	E
Hill, Harold	Va	1909	E
Hilliard, William B.	VIa	1910	E
Hillier, Arthur P.	IIb	1909	E
Hintze, Thomas F.	I	1906	D
Hird, Arthur W.	Ia	1910	E
Hird, James A.	IVa	1910	E
Hitchcock, Thomas B.	Ia-IIa-IIIa	1901	E
Hitchen, Harry S.	Vb	1907	E
Hitchen, Thomas G.	Vb	1907	E
Hodge, William	VIa	1911	E
Hodgkins, Albert A.	VII	1909	E
Hodgkins, Albert A.	IIIa	1910	E
Hoellrich, Martin J.	Vb	1908	E
Hoellrich, Martin J.	Vc	1910	E
Hoessler, Carl, Jr.	IIIa	1906	E
Hogan, James A.	V	1902	E
Holden, Francis C.	IV	1909	D
Holgate, Benjamin	III	1902	D
Holgate, Benjamin	V	1903	D

Name	Course	Class	Day or Evening
Holgate, Charles H.	IIa	1901	E
Holland, Walter F.	IIIa	1912	E
Hollings, James L.	I	1905	D
Holmes, Otis M.	VI	1912	D
Holt, Gavin O.	IVa	1910	E
Holt, Harry C.	VIa	1909	E
Hood, Leslie N.	IV	1912	D
Hook, Russell W.	IV	1905	D
Horsfall, George G.	II-III-V	1904	D
Houston, William I.	IIIa	1909	E
Houston, William I.	Vb	1910	E
Howard, John	V	1900	E
Howard, John	IIIa	1903	E
Howard, John	IIa	1906	E
Howard, John	VII	1907	E
Howard, Thomas	V	1905	E
Howe, Woodbury K.	I	1910	D
Howell, Edward A.	Va	1909	E
Hoyle, Edward	IIb	1902	E
Hoyle, Joseph	IIb	1904	E
Hoyt, Charles W. H.	IV	1907	D
Hubbard, Ralph K.	IV	1911	D
Huising, Geronimo H.	I	1908	D
Hunt, Chester L.	III	1905	D
Hunt, Herbert R.	VI	1905	E
Hunter, Ralph	IIIa	1901	E
Hunter, Ralph	V	1903	E
Hunton, John H.	VII	1910	E
Hunton, John H.	II	1911	D
Hunton, Lewis G.	IV	1905	E
Hurtado, Leopoldo, Jr.	Vc	1910	E
Hurtado, Leopoldo, Jr.	VI	1910	D
Hutchings, James C.	VII	1912	E
Hutton, Clarence	V	1900	E
Hutton, Clarence	III	1903	D
Hutton, Harold	V	1906	E
Hutton, John M.	Vb	1906	E
Hutton, Thomas V.	Vb	1910	E
Ignatius, Pentti	Va	1907	E
Inberg, Magnus	Ia	1906	E
Ingham, Benjamin W.	Ia	1908	E
Jackson, Frank	VIIb	1910	E
Jackson, Frank	VId	1912	E
Jasper, Grant	Vc	1912	E
Jean, Adhemard C.	VIa	1910	E
Jeanotte, Arthur	VI	1904	E
Jelleme, William O.	I	1910	D
*Jenckes, Leland A.	VI	1908	D
Jennings, James J.	IIIa	1903	E
Jepson, Harry	Vb	1907	E
Johnson, Ernest A.	IIa-b	1902	E
Johnson, Ernest A.	V	1906	E
Johnson, Samuel L.	V	1903	E
Jones, Everett A.	III	1904	D
Jones, Everett A.	III	1905	D

*Deceased

Name	Course	Class	Day or Evening
Jones, William J.	IIb	1900	E
Jones, William J.	IIa	1901	E
Jordan, Frederic W.	IV	1910	E
Jorde, Linville T.	VIc	1910	E
Joyce, John	Vc	1909	E
Jury, Alfred E.	IV	1904	D
Kaler, Harold F.	VIIb	1909	E
Kay, Harry P.	II	1909	D
Keleher, John J.	IIb	1903	E
Kellett, Irvine	II	1899	E
Kelley, Bernard J., Jr.	VIc	1909	E
Kelly, Michael H.	Ia	1902	E
Kelly, Michael H.	IIIa	1907	E
Kennedy, William E.	VIa	1911	E
Kent, Arthur	VIIb	1912	E
Kent, Clarence L.	III-V	1906	D
Kent, Ernest J.	IIb	1902	E
Kenworthy, Joseph	Ia	1905	E
Keough, Wesley L.	II	1910	D
Kerrigan, Arthur J.	VIa	1912	E
Kershaw, Benn	Va	1909	E
Kershaw, Benn	Vc	1910	E
Kershaw, Samuel S.	IIb	1910	E
Kershaw, William E.	V	1904	E
Kidd, Thomas E.	IV	1906	E
Killerby, Walter	IIb	1901	E
Kimball, Irving D.	VI	1905	E
Kingsbury, Percy F.	IV	1901	D
Kirsch, Alfred O.	Vb	1907	E
Knowland, Daniel P.	IV	1907	D
Knowles, Frank E.	Ia	1903	E
Krause, George R.	VII	1910	E
Lachance, Melina	IIIb	1911	E
Laffert, August W.	IIIa	1906	E
Laffert, August W.	VII	1907	E
Lagerblad, Jarl	VII	1908	E
LaJeunesse, Joseph A.	IVa	1910	E
Lake, William F.	IIIa	1907	E
Lake, William F.	P. G. IIIa	1908	E
Lakeman, Fannie S.	IIIb	1900	D
Lamb, Arthur F.	II	1910	D
Lambert, Harry	IIb	1912	E
Lamont, Robert L.	II	1912	D
Lamont, Walter M.	IIb	1902	E
Lamson, George F.	I	1900	D
Lamson, George F.	VI	1905	E
Lane, John W.	I	1906	D
Lane, John W.	I-V	1907	D
Langevin, Felix D.	VI	1904	E
Lapierre, Alderic S.	IIIa	1912	E
LaPorte, Philip J.	IVa	1912	E
Laughlin, James K.	III	1909	D
Law, Alfred	IIb	1901	E
Lawliss, Augustine J.	V	1902	E
Lawrence, Charles	Ia	1903	E
Leach, John P.	I-V	1900	D

Name	Course	Class	Day or Evening
Leach, Joseph W.	V	1903	E
Leck, Arthur J.	VII	1910	E
Ledoux, Blanche H.	IIIb	1910	E
Lee, Charles	Ia	1902	E
Lee, William H.	V	1905	D
Leitch, Harold W.	IV	1912	D
Leith, Edwin E.	IIIa	1902	E
Leith, Joseph E.	Vb	1912	E
Lemire, Arthur	Ia	1910	E
Lemire, Arthur	Va	1911	E
Levi, Alfred S.	IV	1909	D
Lewis, LeRoy C.	IV	1908	D
Lewis, Walter S.	IV	1905	D
Libby, C. Robert	VI	1902	E
Linberg, Joseph F.	IVa	1911	E
Lincourt, Hector L.	VI	1903	E
Lincourt, Henry E.	VIIb	1909	E
Linkletter, Alfred C.	VI	1905	E
Lockberg, John L.	VId	1912	E
Logan, George H. S.	IV	1911	E
Lord, Harry D.	IIIa	1904	E
Lord, Wilfred	IIIa	1901	E
Lord, Wilfred	IIb	1903	E
Lord, Wilfred	IIa	1904	E
Lovell, Charles E.	VI	1905	E
Lowe, John C.	IIb	1912	E
Lucey, Edmund A.	II	1904	D
*McAlister, John W.	V	1899	E
McAuliffe, Patrick D.	VIIb	1910	E
McBride, Robert G.	IIa	1904	E
McCann, Martin	Vb	1912	E
McCarthy, Joseph F.	IIIa	1906	E
McClure, Charles G.	VIIb	1909	E
McCool, Frank L.	IV	1910	D
Macdonald, Chester W.	VIIa	1912	E
McDonnell, William H.	I-V	1906	D
McElroy, Samuel H.	Vb	1910	E
McGill, William E.	VII	1908	E
McGovern, James	VII	1908	E
Mackay, Stewart	III	1907	D
McKenna, Hugh F.	IV	1905	D
McKenna, Jeremiah J.	Vb	1908	E
McLaughlin, Peter J.	Ia	1906	E
McLay, John	Vb	1906	E
McLay, John	IIb	1909	E
McManus, Hugh	V	1905	E
McNamara, Thomas	Vb	1911	E
MacPherson, Wallace A.	III	1904	D
McQuade, Hugh B.	V	1901	E
Mabbett, Albert L.	IIIa	1910	E
Madden, Peter	Va	1909	E
Maden, Harry	IIb	1900	E
Maguire, James H.	VI	1905	E
Maguire, James H.	Ia	1906	E
Mahoney, Dennis J.	Vb	1909	E

*Deceased

Name	Course	Class	Day or Evening
Mailey, Howard T.	II	1908	D
Maker, Isaac A.	Ia	1908	E
Manning, Frederick D.	IV	1910	D
Manning, James B.	IVa	1911	E
Marjerison, Isaiah D.	II	1899	E
Marjerison, T. Sydney	IIIa	1907	E
Marjerison, T. Sidney	P. G. IIIa	1908	E
Marinel, Walter N.	I	1901	D
Marsden, Phillips B.	IVa	1911	E
Marshall, Fred K. R.	VI	1908	E
Martin, Harry W.	IV	1911	D
Martin, John C., Jr.	IIa-b	1905	E
Martin, Willard E.	IIIa	1907	E
Mason, Archibald L.	VI	1909	D
Mason, Frederick A.	Ia	1903	E
Maxcy, Leo M.	VIc	1910	E
Meadows, William R.	I	1904	D
Meek, Lotta (See Parker)			
Merchant, Edith C.	IIIb	1900	D
Merrill, Allan B.	IV	1911	D
Merrill, Edwin C.	VI	1904	E
Merriman, Earl C.	II	1907	D
Messiah, Hiram G.	Vb	1910	E
Michael, Joseph C.	Vb	1912	E
Michelmores, Harry	IIIa	1906	E
Michelmores, Harry	VII	1907	E
Midwood, Arnold J.	IV	1905	D
Miller, Emil H.	V	1904	E
Milot, Joseph E.	VIc	1911	E
Minge, Jackson C.	I-V	1901	D
Minge, Jackson C.	IIIa	1901	E
Moir, Alexander L.	IIIa	1899	E
Moir, Alexander L.	P. G. IIIa	1903	E
Molloy, Andrew	V	1902	E
Molloy, Andrew	IIIa	1905	E
Molloy, Andrew	P. G. IIIa	1906	E
Molloy, Andrew	P. G. IIIa	1909	E
Moore, Everett B.	I	1905	D
Moore, Karl R.	IV	1911	D
Moorehouse, Thomas	VI	1904	E
Moorhouse, William R.	IV	1901	D
Morris, Frank A.	V	1901	E
Morrison, Fred C.	I	1903	D
Mortenson, Carl W.	IIIa	1903	E
Mortenson, Carl W.	IIa	1908	E
Morton, Albert N.	IIb	1906	E
*Mozley, Arthur	VI	1903	E
Muldoon, Joseph M.	VIIb	1912	E
Mullen, Arthur T.	II	1909	D
Munroe, Sydney P.	I	1912	D
Murphy, Cornelius D.	IIa	1906	E
Murphy, Howard H.	IIb	1911	E
Murphy, John H.	VI	1904	E
Murray, James A.	II	1910	D
Musard, Albert E., Jr.	Vc	1909	E

*Deceased

Name	Course	Class	Day or Evening
Myers, James W.	IIIa-IV	1903	E
Myers, James W.	VII	1907	E
Najarian, Garabed	IV	1903	D
Naylor, Charles	IVa	1912	E
Nelson, Charles E.	IIb	1907	E
Nelson, Ernest H.	IIb	1900	E
Nelson, Ernest H.	IIa	1901	E
Nelson, Ernest H.	IIIa	1906	E
Nelson, Ernest H.	Ia	1909	E
Nelson, Ernest H.	Vc	1910	E
Nelson, Gustave A.	Vb	1910	E
Nelson, James A.	Ia	1911	E
Nelson, Sigfred	VId	1911	E
Newall, J. Douglas	IV	1909	D
Newall, Preston	Ia	1911	E
Newcomb, Guy H.	IV	1906	D
Newsholme, Charles E.	Vib	1911	E
Nichol, Samuel J.	IVa	1911	E
Nichols, Clarence W.	Vb	1910	E
Nichols, Nathan A.	Vib	1911	E
Nichols, Raymond E.	VI	1910	D
Nicholson, Richard	IIb	1903	E
Nicoll, John	IVa	1910	E
Niven, Robert S.	VI	1912	D
Noble, John T.	V	1899	E
Noble, John T.	IIIa	1901	E
Noonan, Denis T.	IIIa	1903	E
Notman, Frederick W.	Ia	1904	E
Nugent, Thomas A.	II-V	1899	E
Nugent, Thomas A.	VI	1902	E
Nutter, James R.	VI	1908	E
O'Brien, David A.	IV	1906	E
O'Brien, Michael F.	IIb	1907	E
O'Connell, Clarence E.	IV	1911	D
O'Donnell, John D.	I-V	1904	D
Ogley, Samuel A.	IIb	1900	E
O'Hara, William F.	IV	1904	D
O'Neill, Peter F.	IV	1905	E
Orrell, Frank L.	Vib	1909	E
Orrell, Frank L.	IIb	1912	E
*Osbeck, William J.	IIIa	1908	E
Osgood, Charles F.	Ia	1900	E
Osgood, Charles F.	VI	1902	E
Overend, John	V	1905	E
Palm, Carl H.	VIa	1912	E
Palmer, G. Buel	IIIa	1903	E
Palmer, G. Buel	Vb	1909	E
Paquin, Joseph	VIa	1909	E
Paquin, Joseph	Vib	1910	E
Parker, B. Moore	I	1901	D
Parker, Everett N.	I-III-V	1904	D
Parker, Everett N.	I	1905	D
Parker, Harry C.	V	1900	D
Parker, Lotta Meek	IIIb	1907	D
Parkin, Prescott R.	Vb	1911	E

*Deceased

Name	Course	Class	Day or Evening
Parkis, William L.	I	1909	D
Parsons, Joseph G.	IIIa	1909	E
Patrick, Alexander	IIIa	1904	E
Patterson, Alfred H.	IIIa	1908	E
Pearson, Alfred H.	IV	1911	D
Pearson, Fred	VIa	1909	E
Pease, Chester C.	I	1909	D
Pedler, William A.	Ia	1906	E
Pedler, William A.	IVa	1911	E
Peel, Hudson	IIb	1901	E
Perkins, John E.	III	1900	D
Perkins, J. Dean	III	1908	D
Perkins, Thomas, Jr.	Ia	1908	E
Perron, Francis J.	Vb	1911	E
Perry, Clarence R.	IIb	1911	E
Petterson, Birger	VIa	1910	E
Petty, George E.	I-V	1903	D
Phelps, Mary I.	IIIb	1910	E
Picken, William T.	IIIa	1908	E
Pihl, Christian E.	VI	1906	E
Pihl, Ingrid I.	IIIb	1912	E
Pittendreigh, John M.	Ia	1906	E
Plumer, Paul T.	Vb	1908	E
Porter, George K., Jr.	IIIa	1907	E
Porter, George K., Jr.	P. G. IIIa	1908	E
Potter, Carl H.	I	1909	D
Potter, Richard W.	V	1902	E
Pottinger, James G.	II	1912	D
Pradel, Alois J.	III	1900	D
Pradel, Anna Walker	IIIb	1903	D
Preble, George A.	IIIa	1908	E
Preble, George A.	Va	1912	E
Prescott, Walker F.	IV	1909	D
Prescott, William B.	Va	1912	E
Prince, Sylvanus C.	VI	1908	D
Proctor, Braman	IV	1908	D
Putnam, Leverett N.	IV	1910	D
Racicot, Marie E.	IIIb	1911	E
Ramsdell, Theodore E.	I	1902	D
*Rasche, William A.	III	1903	D
Raymond, Charles A.	IV	1907	D
Read, Paul A.	VII	1907	E
Read, Paul A.	Va	1909	E
Reardon, Timothy H.	VI	1906	E
Redman, Henry S.	IIIa	1904	E
Redman, Henry S.	V	1905	E
Redman, Henry S.	Ia	1907	E
Redman, Henry S.	IV	1910	E
Redman, Henry S.	VIa	1912	E
Reed, Foster C. K.	VI	1904	E
Reed, Norman B.	I	1910	D
Reynolds, Eugene A.	VI	1906	E
Reynolds, Fred B.	II	1908	D
Reynolds, Hiram L.	IIIa	1901	E
Reynolds, Isabel H.	III-V	1903	D

*Deceased

Name	Course	Class	Day or Evening
Reynolds, Isabel H.	P. G. III-V	1906	D
Rhodes, Joseph E.	V	1904	E
Rich, Everett B.	III	1911	D
Richards, Francis G.	IIa	1906	E
Riley, Edward T.	IIIa	1912	E
Ritter, Alfred E.	IIb	1907	E
Robbins, John	IIb	1907	E
Roberson, Pat H.	I	1905	D
Roberts, Carrie I.	IIIb	1905	D
Robinson, Ernest W.	IV	1908	D
Robinson, James E.	VII	1911	E
Robinson, Ruddach P.	VII	1911	E
Robinson, Thomas	Ia	1909	E
Robinson, Thomas	Vc	1910	E
Robinson, William C.	III-V	1903	D
Robson, Frederick W. C.	IV	1910	D
Roche, Raymond V.	IV	1912	D
Rockwell, Henry D.	IIa	1903	E
Rockwell, Samuel F.	IIa	1902	E
Rogers, John F.	Ia	1911	E
Rollins, Henry E.	VII	1912	E
Rooney, George W.	Ia	1904	E
Root, Francis X., Jr.	IIIa	1910	E
*Rowell, Herman C.	Ia-IIb	1900	E
Rowlands, Harold	Va	1911	E
Royds, James	Ia	1912	E
Rundlett, Arnold D.	VI	1912	D
Rushworth, Walter	VI	1906	E
Ryan, Edward P.	Ia	1909	E
Saalfrank, Joseph C.	IIIa	1908	E
Saunders, Edward B.	IIIa	1901	E
Saunders, Harold F.	IV	1909	D
Savage, Charles F.	IVa	1912	E
Scally, Edward	VI	1908	E
Scanlon, Edward J.	IIb	1901	E
Schermerhorn, George E.	Ia	1902	E
Schermerhorn, George E.	Va	1903	E
Schofield, John S.	IIIa	1903	E
Schoon, Fenton	IIb	1903	E
Schubert, George J.	V	1906	E
Schubert, George J.	IIIa	1909	E
Schuerfeld, Harry W.	IIIa	1909	E
Schuster, William F.	VII	1908	E
Seddon, N. Graham	IIIa	1908	E
Semple, Alexander	IIIa	1908	E
Senior, George	Va	1906	E
Senior, George	Ia-Vc	1907	E
Shackelton, John H.	IV	1908	E
Shackleton, John H.	Ia	1910	E
Shaffer, William A.	VId	1911	E
Shannon, Philip J.	V	1901	E
Sharpe, John R.	VI	1906	E
Shaw, James	V	1904	E
Shea, Francis J.	II	1912	D
Shearer, David D.	VII	1912	E

*Deceased

Name	Course	Class	Day or Evening
Sheppard, Byron H.	VI	1906	E
Shields, John J.	Va	1911	E
Sidebottom, Leon W.	IV	1911	D
Silcox, Arthur E.	Ia	1900	E
Silk, Frederick C. M.	IV	1905	E
Silk, Patrick E.	VII	1906	E
Simola, Emil J.	IIa-b	1905	E
Simoneau, Verner W.	VI	1908	E
Skidmore, Russell P.	VIIb	1912	E
Skinner, Clarence W.	IIIa	1905	E
Skinner, Clarence W.	P. G. IIIa	1906	E
Skinner, Clarence W.	VII	1907	E
Sleeper, Robert R.	IV	1900	D
*Smith, Albert A.	I	1899	D
Smith, Arthur	IIIa	1905	E
Smith, Arthur	P. G. IIIa	1906	E
Smith, Arthur	Va	1906	E
Smith, Arthur	Vc	1907	E
Smith, Arthur	P. G. IIIa	1909	E
Smith, Doane W.	II	1910	D
Smith, Edward	Ia	1904	E
Smith, Ernest B.	Vb	1907	E
Smith, Fred	IIb	1901	E
Smith, George A.	IIIa	1905	E
Smith, George A.	P. G. IIIa	1906	E
Smith, George A.	VII	1909	E
Smith, James	Vb	1907	E
Smith, John W.	IIb	1904	E
Smith, Percy H.	Vb	1907	E
Smith, Ralston F.	I	1904	D
Smith, Stephen E.	I	1900	D
Smith, Theophilus G., Jr.	IV	1910	D
Smith, William E.	IIIa	1905	E
Smith, William E.	P. G. IIIa	1906	E
Smith, William E.	VII	1907	E
Smith, William E.	P. G. IIIa	1909	E
Smith, William F.	VId	1912	E
Smith, William H.	IIb	1902	E
Snelling, Fred N.	II	1903	D
Snow, Fred L.	IV	1900	E
Spedding, Ephraim H.	IIIa	1899	E
Spiegel, Edward	V	1903	D
Spurr, Albert R.	VII	1908	E
Spurr, James H., Jr.	IV	1908	E
Standish, John C.	IV	1911	D
Stanley, John R.	IIb	1911	E
Stearns, Orlo F.	IVa	1911	E
Sterling, Walter	IIIa	1904	E
Stevens, Dexter	I	1904	D
Stevens, Frank W.	VI	1905	E
Stevens, Harold S.	IIIa	1912	E
Stevenson, Murray R.	III-V	1903	D
Stevenson, Robert P.	Ia	1912	E
Stevenson, William	II	1899	E
Stevenson, William	IIIa	1902	E

*Deceased

Name	Course	Class	Day or Evening
Stewart, Arthur A.	II	1900	D
Stewart, Charles	Va	1908	E
Stewart, George	Ia-IVa	1911	E
Stewart, Walter L.	III	1903	D
Stewart, William W.	IV	1910	E
Stockham, Burton I.	IV	1903	E
Stockham, Burton I.	P. G. IV	1904	E
Stocks, Carl W.	VIa	1909	E
Stohn, Alexander C.	III-V	1906	D
Stone, Ira A.	IV	1909	D
Stopherd, William H.	II-V	1899	E
Stopherd, William H.	VI	1902	E
Stopherd, William H.	IIIa	1905	E
Stopherd, William H.	P. G. IIIa	1906	E
Stopherd, William H.	P. G. IIIa	1909	E
Stopherd, William H.	VII	1910	E
Storer, Francis E.	II	1907	D
Stott, Bertram S.	Vb	1910	E
Stott, Samuel	IV	1910	E
Stronach, Irving N.	IV	1910	D
Stursberg, Paul W.	II	1907	D
Sugden, Albert G.	IIIa	1912	E
*Sullivan, Humphrey F.	Ia	1909	E
Sullivan, John D.	VI	1912	D
Sullivan, Michael F.	VIIb	1910	E
Swan, Guy C.	II	1906	D
Swanson, Victor E.	IVa	1912	E
Swift, Edward S.	V	1899	E
Swift, Edward S.	Ia	1901	E
Swift, Edward S.	I	1902	D
Sykes, Alvin E.	VIa	1909	E
Syme, James F.	II	1900	D
Tarpey, John F.	IIa	1904	E
Taylor, Harold S.	VIIb	1912	E
Teichmann, Alfred A.	Vb	1908	E
Tennant, Joseph A.	VIIb	1911	E
Thaxter, Joseph B., Jr.	II	1912	D
Thomas, Roland V.	I	1905	D
Thompson, Charles B.	VI	1904	E
Thompson, Everett L.	I	1905	D
Thompson, Henry J.	IV	1900	D
Tilton, Elliott T.	II	1899	D
Todd, Henry	VII	1910	E
Tonge, John	IV	1905	E
Tonge, Matthew	IIIa	1903	E
Toovey, Sidney E.	V	1904	D
Toshach, Reginald A.	II	1911	D
Towers, Frederic G.	Ia	1912	E
Tucker, John T.	Ia	1908	E
Tucker, John T.	Va	1909	E
Turgeon, Roderick	IVa	1912	E
Umpleby, Thomas B.	V	1902	E
Upton, Frank A.	Ia	1903	E
Varney, Manley H.	IIIa	1902	E
Varney, Manley H.	Ia	1903	E

*Deceased

Name	Course	Class	Day or Evening
Varnum, Arthur C.	II	1906	D
Varnum, Arthur C.	Vb	1907	E
Varnum, Arthur C.	P. G. IIIa	1908	E
Varnum, Arthur C.	VII	1909	E
Vause, John	Va	1912	E
Vogt, Alfred H.	IIIa	1902	E
Vogt, Alfred H.	IIb	1909	E
Vogt, Harry A.	Vb	1906	E
Wade, Frank J.	Vb	1911	E
Wahlberg, Einar S.	Ia	1907	E
Walker, Alfred S.	II	1911	D
Walker, Anna G. (See Pradel)			
Walker, David	IIIa	1902	E
Walker, David	P. G. IIIa	1903	E
Walker, William, Jr.	VII	1906	E
Walsh, Michael L.	Ia	1909	E
Walton, Frank L.	Ia	1911	E
Ward, Bernard D.	IIIa	1911	E
Ward, Herbert H.	Vb	1912	E
Ward, James J.	VII	1906	E
Wardrobe, William L.	Ia	1900	E
Ware, Edward W.	IIIa	1909	E
Warren, Philip H.	II	1905	D
Waterhouse, Joseph	IV	1900	E
Waterworth, Frank W.	Vb	1907	E
Watson, Luther F.	IIb	1909	E
Watson, William	III	1911	D
Webb, Francis H.	V	1904	E
Webb, Francis H.	IIIa	1907	E
Webb, Frank H.	IV	1904	D
Webber, Arthur H.	IV	1901	D
Webber, John F.	IIIa	1907	E
Webber, John F.	P. G. IIIa	1908	E
Webster, Orrin H.	Ia	1912	E
Weigel, Frederick A.	VIb	1909	E
Weinz, W. Elliot	IV	1908	D
Welch, Benjamin L.	VIb	1910	E
Wesson, Paul B.	Ia	1901	E
Wheelock, Stanley H.	II	1905	D
*Whitcomb, Harry E.	Ia	1906	E
Whitcomb, Roscoe M.	IV	1910	D
White, Royal P.	II	1904	D
Whitehead, Bennett	IIb	1901	E
Whitehill, Warren H.	IV	1912	D
Whitman, William P.	IVa	1910	E
Whitney, Frederick A.	IV	1910	E
Whittaker, Thomas B.	IIb	1907	E
Whittaker, Thomas B.	IIb	1908	E
Wicks, Frederic M.	IIIa	1912	E
Wiggin, Leon M.	IIIa	1907	E
Wiggin, Leon M.	P. G. IIIa	1908	E
Wightman, William H.	IV	1906	D
Wilde, Thomas E.	IIa	1905	E
Wilkinson, Joseph	IIIa	1912	E
Wiley, Frank S.	Ia	1901	E

*Deceased

Name	Course	Class	Day or Evening
Willgeroth, Henry J.	IIIa	1908	E
Williams, Allen R.	Ia	1910	E
Williams, Allen R.	Va	1911	E
Williamson, Isaac F.	IV	1901	E
Willmott, Herbert J.	VIa	1911	E
Wilmot, Joseph	IIIa	1908	E
Wilmot, William	IIIa	1899	E
Wilson, Calvin E.	IIb	1902	E
Wilson, George H.	IIb	1902	E
Wilson, John S.	II	1903	D
*Wilson, Walter E. H.	I-V	1904	D
Wilton, George H.	IIIa	1899	E
Wing, Charles T.	IIIa	1900	E
Wing, Charles T.	III	1902	D
Wingate, William H.	IV	1908	D
Wise, Paul T.	II	1901	D
Wiswall, Frank T.	V	1905	E
Wolf, William C.	Va	1907	E
Wolf, William C.	Vb	1908	E
Wolger, John J.	IIIa	1907	E
Wollin, Frederick W.	Va	1911	E
Wood, Arthur S.	Va	1912	E
Wood, Ernest H.	IV	1911	D
Wood, Herbert C.	I	1906	D
Wood, J. Carleton	IV	1909	D
Wood, Jonathan	Ia	1902	E
Wood, Jonathan	Va	1908	E
Woodbury, W. Sanford	Ia	1900	E
Woodcock, Eugene C.	II	1907	D
Woodies, Ida A.	IIIb	1900	D
Woodies, Ida A.	P. G. IIIb	1901	D
Woodman, Harry L.	I-III-V	1902	D
Woodruff, Charles B.	V	1906	D
Worthington, John A.	Ia	1910	E
Wright, Edward, Jr.	II	1905	D
Wright, Frederick J.	Vb	1911	E
Yare, John F.	Vb	1907	E
Yavner, Harry	II	1912	D
Young, Richard, Jr.	Va	1908	E
Young, Richard, Jr.	Vc	1909	E

*Deceased

REGISTER OF GRADUATES

(P. G.) Indicates Post Graduate Course
 (x) Indicates Last Known Address
 (*) Deceased

Day Course, 1899

Diploma Graduates

Name	Course	Occupation
xBailey, Joseph W.	I	Superintendent, Samoset Mills, Valley Falls, R. I.
Cuttle, James H.	II	Designer, William Whitman and Co., New York City.
Fels, August B.	II	With William Fels, Inc., New York City.
xHarmon, Charles F.	I	In business, Lowell, Mass.
*Smith, Albert A.	I	
xTilton, Elliott T.	II	With Western Electric Co., Boston, Mass.

Certificate Holders

Burrage, Katherine C.	IIIb	Teacher of Pottery, Social Service Dept., Massachusetts General Hospital and No. Burnet St. Industrial School, Boston, Mass.
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Evening Course, 1899

Certificate Holders

*Berry, Frank M.	IIIa	
Binns, Heaton	II-V	Foreman, Worsted Department, Shuttleworth Bros. Co., Amsterdam, N. Y.
xBroadbent, James T.	Ia	In Converting House, New York City.
Collier, John	IIIa	Superintendent and Manager, Crawford Woolen Co., Martinsburg, W. Va.
Crompton, Henry H.	II	Overseer, Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
Gaunt, Alfred C.	IIIa	Treasurer and Manager, Tremont Worsted Co., Methuen, Mass.
Kellett, Irvine	II	Second Hand, Worsted Yarns, Pacific Mills, Lawrence, Mass.
*McAlister, John W.	V	
Marjerison, Isaiah D.	II	Overseer, Worsted Combing, Lower Pacific Mills, Lawrence, Mass.
Moir, Alexander L.	IIIa	Letter Carrier, Lowell, Mass.
Noble, John T.	V	Overseer, Sawyer Woolen Mill, Dover, N. H.
Nugent, Thomas A.	II-V	Foreman, Worsted Department, McClarey, Wallin & Crause, Amsterdam, N. Y.
Spedding, Ephraim H.	IIIa	Overseer, Weaving, Massachusetts Cotton Mills, Lowell, Mass.
xStevenson, William	II	Superintendent, Franklin Woolen Mills, Franklin, Ky.
Stopherd, William H.	II-V	With Saco-Lowell Shops, Lowell, Mass.

Name	Course	Occupation
Swift, Edward S.	V	Scholastic of the Society of Jesus, Woodstock College, Woodstock, Md.
Wilmot, William	IIIa	Designer, Hamilton Webb Co., Hamilton, R. I.
xWilton, George H.	IIIa	Overseer, M. T. Stevens and Sons Company, North Andover, Mass.

Day Course, 1900

Diploma Graduates

Baldwin, Arthur L.	IV	President, Monarch Chemical Laboratory, Lowell, Mass.
Barr, I. Walwin	I	Styler, F. U. Stearns & Co., New York City.
Bodwell, Henry A.	II	Superintendent, Smith and Dove Mfg. Co., Andover, Mass.
Brickett, Chauncey J.	II	Principal, School of Textiles, International Correspondence Schools, Scranton, Pa.
Lamson, George F.	I	Draftsman, Chas. T. Main, Engineer, Boston, Mass.
Perkins, John E.	III	Assistant Superintendent, S. N. and C. Russell Mfg. Co., Pittsfield, Mass.
Pradel, Alois J.	III	Superintendent, Montrose Woolen Mills, Woonsocket, R. I.
Sleeper, Robert R.	IV	Instructor in Dyeing, Lowell Textile School, Lowell, Mass.
Smith, Stephen E.	I	Head Instructor, Cotton Department, Lowell Textile School, Lowell, Mass.
Stewart, Arthur A.	I	Head Instructor, Finishing, Lowell Textile School, Lowell, Mass.
Syme, James F.	II	Agent, Saxonville Mills, Saxonville, Mass.
Thompson, Henry J.	IV	Dyer, Boston Rubber Shoe Co., Malden, Mass.

Certificate Holders

Burrage, Katherine C.	P. G. IIIb	See Day Course, 1899.
Campbell, Laura E.	IIIb	Designer, Lowell, Mass.
xHarrison, Mrs. Amy H. (Goodhue)	IIIb	Dracut, Mass.
Lakeman, Fannie S.	IIIb	Designer, Salem, Mass.
xLeach, John P.	I-V	Foreman, Harriet Cotton Mills, Hender- son, N. C.
Merchant, Edith C.	IIIb	Supervisor of Drawing, Pepperell, Mass.
Parker, Harry C.	V	With Parker Piano & Victrola Co., Bos- ton, Mass.
Woodies, Ida A.	IIIb	Decorator, Lowell, Mass.

Evening Course, 1900

Certificate Holders

Campbell, Albert D.	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
Cawthra, Albert B.	IIb	Overseer, U. S. Bunting Co., Lowell, Mass.

Name	Course	Occupation
Colby, Arthur D.	Ia	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Donnelly, James	Ia	Second Hand, Mule Room, Manchester Mills, Manchester, N. H.
Elston, Frederick R.	IIIa	Assistant Superintendent and Designer, Shackamaxon Worsted Co., Philadelphia, Pa.
Howard, John	V	Overseer, Weaving, Faulkner's Mills, No. Billerica, Mass.
Hutton, Clarence	V	Circulation Manager, Lord and Nagle Co., Boston, Mass.
Jones, William J.	I Ib	Overseer, Worsted Spinning, U. S. Bunting Co., Lowell, Mass.
xMaden, Harry	I Ib	North Adams, Mass.
Nelson, Ernest H.	I Ib	Designer, Merrimack Mfg. Co., Lowell, Mass.
Ogley, Samuel A.	I Ib	Overseer, Worsted Spinning, Steere Worsted Mills, Providence, R. I.
Osgood, Charles F.	Ia	Draftsman, General Electric Company, Lynn, Mass.
*Rowell, Herman C.	Ia-I Ib	
Silcox, Arthur E.	Ia	Draftsman, Saco-Lowell Shops, Lowell, Mass.
xSnow, Fred L.	IV	Granite Contractor, Snow & Horsfall, Lowell, Mass.
Wardrobe, William L.	Ia	
xWaterhouse, Joseph	IV	Section Hand, Merrimack Mfg. Company, Lowell, Mass.
Wing, Charles T.	IIIa	Designer, Middlesex Mfg. Company, Lowell, Mass.
Woodbury, W. Sanford	Ia	Superintendent of Carding, Warner Mills and American Textilose Co., Newburyport, Mass.

Day Course, 1901

Diploma Graduates

Buchan, Donald C.	II	Assistant Superintendent, Stevens Mills, North Andover, Mass.
Currier, John A.	II	Superintendent, Pentucket Mills, M. T. Stevens and Sons Co., Haverhill, Mass.
xEwer, Nathaniel T.	IV	Chemist, American Dyewood Co., Chester, Pa.
Foster, Clifford E.	II	Lowell, Mass.
Kingsbury, Percy F.	IV	Overseer, Color Dept., Merrimack Mfg. Co., Lowell, Mass.
Marinel, Walter N.	I	In Automobile Business, North Chelmsford, Mass.
Moorhouse, William R.	IV	Chemist, Cassella Color Co., Boston, Mass.
Parker, B. Moore	I	Instructor, Carding and Spinning, A. and M. College, West Raleigh, N. C.
Webber, Arthur H.	IV	Chemist and Dyer, Melville Color Co., Beverly, Mass.
Wise, Paul T.	II	Manufacturing Agent and Assistant General Manager, Chelsea Fibre Mills, Brooklyn, N. Y.

Certificate Holders

Name	Course	Occupation
Bradley, Richard H.	V	Second Hand, Hargreaves Mill No. 2, Fall River, Mass.
xHarrison, Mrs. Amy H. (Goodhue)	P. G. IIIb	See Day, 1900.
Minge, Jackson C.	IV	Treasurer, Minge Mfg. Co., Demopolis, Ala.
Woodies, Ida A.	P. G. IIIb	See Day, 1900.

Evening Course, 1901

Certificate Holders

xAspinwall, William	IIb	Philadelphia, Pa.
*Berry, Frank M.	V	
xBrooks, Noah	IIIa-V	Lowell, Mass.
xBurghardt, Paul C.	IIa	Second Hand, Card Room, Merrimack Woolen Co., Lowell, Mass.
Buzzell, William O.	IIIa	Overseer, Weaving, Bristol Mfg. Co., New Bedford, Mass.
Cheetham, John James	IIIa	Overseer, Cabot Mfg. Co., Brunswick, Me.
Chippindale, Ernest W.	IIb	Pile Wire Maker, Frank Parker Pile Wire Co., Lowell, Mass.
xCowdell, Herbert	V	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
*Davis, Henry	IIb	
xDonovan, Daniel F.	IIa	Second Hand, Woolen Carding, Yonkers, N. Y.
Evison, William A.	V	Loomfixer, Massachusetts Cotton Mills, Lowell, Mass.
Farrell, Thomas	IIa	Woolen Spinner, Stirling Mills, Lowell, Mass.
Frame, William C.	V	Overseer, Johnson & Johnson, New Bruns- wick, N. J.
Gagan, John H.	V	Clinton, Mich.
Grant, Archibald	IIb	Lowell, Mass.
Grouke, Michael	IIb	Overseer, Worsted Drawing, Bigelow Car- pet Company, Lowell, Mass.
Hill, Daniel	IIb	Overseer, Passaic Worsted Spinning Co., Passaic, N. J.
Hitchcock, Thomas B.	Ia-IIa-IIIa	Assistant to General Manager, Inter- national Cotton Mills Corporation, New York City.
Holgate, Charles H.	IIa	With A. R. Andrews, Boston, Mass.
Hunter, Ralph	IIIa	Salesman, Hall, Hartwell and Company, Troy, N. Y.
Jones, William J.	IIa	See Evening, 1900.
Killérby, Walter	IIb	Overseer, Park Worsted Mill, Lowell, Mass.
Law, Alfred	IIb	Overseer, Arlington Mills, Lawrence, Mass.
Lord, Wilfred	IIIa	Assistant Superintendent, Worsted Dept., Lower Pacific Mills, Lawrence, Mass.
McQuade, Hugh B.	V	Loomfixer, Bigelow Carpet Company, Lowell, Mass.

Name	Course	Occupation
Minge, Jackson C.	IIIa	See Day, 1901.
xMorris, Frank A.	V	Loomfixer, Lowell, Mass.
Nelson, Ernest H.	IIa	See Evening, 1900.
Noble, John T.	IIIa	See Evening, 1899.
Peel, Hudson	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
Reynolds, Hiram L.	IIIa	Agent, Saunders Cotton Mills, Saundersville, Mass.
xSaunders, Edward B.	IIIa	Salesman, Remington Typewriter Co., Fall River, Mass.
Scanlon, Edward J.	IIb	In business, Lawrence, Mass.
Shannon, Philip J.	V	Die Maker, Tubular Rivet and Stud Company, Wollaston, Mass.
*Smith, Fred	IIb	
Swift, Edward S.	Ia	See Evening, 1899.
Wesson, Paul B.	Ia	Master Mechanic, Saco-Lowell Shops, Lowell, Mass.
Whitehead, Bennett	IIb	Overseer, Wood Worsted Mills, Lawrence, Mass.
Wiley, Frank S.	Ia	Second Hand, Picking and Carding, Pacific Mills, Lawrence, Mass.
Williamson, Isaac F.	IV	Overseer, Dyeing Dept., Hamilton Mfg. Co., Lowell, Mass.

Day Course, 1902

Diploma Graduates

xBurnham, Frank E.	IV	Chemist, Avery Chemical Co., Boston, Mass.
Carter, Robert A.	IV	Chemist and Textile Expert, Roessler & Hasslacher Chemical Company, New York City.
xCraig, Clarence E.	III	With Kansas City Cotton Mills Co., Kansas City, Kans.
Haskell, Walter F.	IV	Overseer of Dyeing, Dana Warp Mills, Westbrook, Me.
Ramsdell, Theodore E.	I	Agent, Monument Mills, Housatonic, Mass.
Swift, Edward S.	I	See Evening, 1899.
Wing, Charles T.	III	See Evening, 1900.

Certificate Holders

Curran, Charles E.	II-III-V	Head Designer, Wood Worsted Mills, Lawrence, Mass.
Ferguson, Arthur F.	I	Head of Textile Dept., Rhode Island School of Design, Providence, R. I.
Harris, George S.	I	Superintendent, Lanett Cotton Mills, Lanett, Ala.
Holgate, Benjamin	III	Cost Accountant, Boott Mills, Lowell, Mass.
Woodman, Harry L.	I-III-V	Draftsman, Saco-Lowell Shops, Lowell, Mass.

Evening Course, 1902

Certificate Holders

Name	Course	Occupation
xAdams, Wm. R.	IIa	Pressman, Stevens Mills, No. Andover, Mass.
xBarlow, Robert	V	Lowell, Mass.
Binns, Heaton	VI	See Evening, 1899.
Bowring, George P. B.	VI	Optometrist, Lowell, Mass.
xBrainerd, Irving L.	Ia	Overseer, Carding, W. L. Barrell and Co., Lawrence, Mass.
xBurghardt, Edward S.	IIa	Lawrence, Mass.
Buzzell, William O.	P. G. IIIa	See Evening, 1901.
Cheetham, John James	P. G. IIIa	See Evening, 1901.
Collier, John	P. G. IIIa	See Evening, 1899.
Cowdrey, Charles E.	V	Overseer, Talbot Mills, North Billerica, Mass.
xCremin, Daniel J.	Ia	Second Hand, Boott Mills, Lowell, Mass.
xDonnellan, Frank T.	IIa	Lowell, Mass.
xDudley, George E.	Ia	Third Hand, Carding, Mass. Mills, Lowell, Mass.
Ferguson, Thomas	V	Overseer, Boott Mills, Lowell, Mass.
xField, Charles W.	VI	Draftsman, C. F. Morrill, Somerville, Mass.
xForrest, Fred G.	IIa	Finishing Room, Middlesex Co., Lowell, Mass.
Fortune, David A.	IIb	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Gaunt, Alfred C.	P. G. IIIa	See Evening, 1899.
xGood, Henry	Ia	Providence, R. I.
xHaigh, Walter	IIIa	U. S. Bunting Co., Lowell, Mass.
Haworth, Joseph	VI	Travelling Mechanical Engineer, C. G. Sargent's Sons Corp., Graniteville, Mass.
Hogan, James A.	V	Hogan Bros., Lowell, Mass.
Hoyle, Edward	IIb	President and Manager, Allerton Worsted Mills, Lowell, Mass.
Johnson, Ernest A.	IIa-b	Superintendent, Washington Mills, Lawrence, Mass.
Kelly, Michael H.	Ia	Overseer, Appleton Co., Lowell, Mass.
Kent, Ernest J.	IIb	Section Hand, English Drawing, Lower Pacific Mills, Lawrence, Mass.
xLamont, Walter M.	IIb	Agent, Wood Worsted Mill, Lawrence, Mass.
xLawliss, Augustine J.	V	Overseer, Weaving, Belvidere Woolen Co., Lowell, Mass.
Lee, Charles	Ia	Machinist, Saco-Lowell Shops, Lowell, Mass.
Leith, Edwin E.	IIIa	Assistant Superintendent, Thos. Kent Mfg. Co., Clifton Heights, Pa.
Libby, C. Robert	VI	Assistant Engineer, Locks & Canals, Lowell, Mass.
Molloy, Andrew	V	In City Water Department, Lowell, Mass.
Nugent, Thomas A.	VI	See Evening, 1899.
Osgood, Charles F.	VI	See Evening, 1900.
Potter, Richard W.	V	Overseer, Weaving, Massachusetts Cotton Mills, Lowell, Mass.

Name	Course	Occupation
Rockwell, Samuel F.	IIa	Superintendent, Mule Dept., Davis and Furber Machine Co., No. Andover, Mass.
Schermerhorn, George E.	Ia	Overseer, Boott Mills, Lowell, Mass.
Smith, William H.	IIb	Stamp Clerk, Postoffice, Lawrence, Mass.
Stevenson, William	IIIIa	See Evening, 1899.
Stopherd, William H.	VI	See Evening, 1899.
Umpelby, Thomas B.	V	Designer, Stanley Woolen Company, Uxbridge, Mass.
Varney, Manley H.	IIIIa	Superintendent, Finishing Dept., Amoskeag Mfg. Co., Manchester, N. H.
xVogt, Alfred H.	IIIIa	Designing Room, George E. Kunhardt, Lawrence, Mass.
xWalker, David	IIIIa	Overseer, Burlington Mills, Winooski, Vt.
Wilson, Calvin E.	IIb	Overseer, Anco Mill, Wilkinsonville, Mass.
Wilson, George H.	IIb	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Wood, Jonathan	Ia	Overseer, Boott Mills, Lowell, Mass.

Day Course, 1903

Diploma Graduates

xBloom, Wilfred N.	IV	Assistant Manager, Read, Holliday and Sons, Ltd., New York City.
Campbell, Orison S.	II	Superintendent, American Felt Co., Franklin, Mass.
Chamberlin, Frederick E.	I	Overseer of Spinning, Monument Mills, Housatonic, Mass.
Emerson, Frank W.	II	Superintendent, Moosup Mills, Moosup, Conn.
xEvans, Alfred W.	III	Arlington Mills, Lawrence, Mass.
xEvans, William R.	III	Bradford, Mass.
Ferguson, Arthur F.	I	See Day, 1902.
Fuller, George	I	Associate Editor, American Wool and Cotton Reporter, New York City.
xGerrish, Walter	III	With Allen Lane Co., Boston, Mass.
Morrison, Fred C.	I	Assistant Superintendent, Levi W. Phelps, Ayer, Mass.
Najarian, Garabed	IV	Overseer of Dyeing, Monument Mills, Housatonic, Mass.
*Rasche, William A.	III	
xSnelling, Fred N.	II	With American Express Co., Haverhill, Mass.
Stewart, Walter L.	III	Cotton Goods Converter, Charles Kohlman & Co., Inc., New York City.
xWilson, John S.	II	With H. Banendahl & Co., New York City.

Certificate Holders

Bennett, Edward H.	V	Publisher, F. P. Bennett and Co., Inc., New York City.
xCampbell, Louise P.	IIIIb	Designer, Lowell, Mass.
Holgate, Benjamin	V	See Day, 1902.
Hutton, Clarence	III	See Evening, 1900.
Petty, George E.	I-V	Secretary and Treasurer, Sampson Power Co., Clinton, N. C.

Name	Course	Occupation
Pradel, Mrs. A. J. (Walker)	IIIb	Woonsocket, R. I.
Reynolds, Isabel H.	III-V	Clerk, Arlington Mills, Lawrence, Mass.
xRobinson, William C.	III-V	With Russell Mfg. Co., Middletown, Conn.
Spiegel, Edward	V	In business, New York City.
Stevenson, Murray R.	III-V	Clinton, Mass.

Evening Course, 1903

Certificate Holders

Adams, Henry S.	IIa	Treasurer, The Springstein Mills, Chester, S. C.
Balmforth, James H.	IIa	Postal Clerk, P. O., Bloomfield, N. J.
Barry, Edward J.	IIIa	Overseer, Jackson Company, Nashua, N. H.
Bastow, Henry	IIIa	Textile Inspector, Quartermaster's Dept., Philadelphia, Pa.
Baxter, Alvah J.	IIa	Clerk, Wood Worsted Mills, Lawrence, Mass.
Byam, Walter S.	VI	Clerk, Saco-Lowell Shops, Lowell, Mass.
Cady, Dennis J.	V	Loomfixer, Washington Mills, Lawrence, Mass.
Donnellan, Frank T.	V	See Evening, 1902.
Flynn, John J.	VI	City of Lowell Fire Dept., Lowell, Mass.
French, Mrs. Martha B. (Balmforth)	IIIa	Tewksbury, Mass.
xGarner, William	IIIa	Foreman of Refinery, Warren Bros. Co., Washington, D. C.
Gaunt, Alfred C.	IIa	See Evening, 1899.
Goodchild, George	Ia	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Gray, Finley M.	VI	Clerk, Merrimack Mfg. Co., Lowell, Mass.
xHiggins, James A.	IIa	Spinner, Talbot Mills, No. Billerica, Mass.
Howard, John	IIIa	See Evening, 1900.
Hunter, Ralph	V	See Evening, 1901.
Jennings, James J.	IIIa	Overseer of Weaving, Salmon Falls Mfg. Co., Salmon Falls, N. H.
Johnson, Samuel L.	V	Second Hand, Weaving, Arlington Mills, Lawrence, Mass.
Keleher, John J.	IIb	Overseer, Drawing Dept., Prospect Mill, Lawrence, Mass.
Knowles, Frank E.	Ia	Inspector, Factory Mutual Insurance Co., Boston, Mass.
xLawrence, Charles	Ia	Overseer, Mule Spinning, Dartmouth Corp., New Bedford, Mass.
Leach, Joseph W.	V	Designer, Pacific Mills, Lawrence, Mass.
xLincourt, Hector L.	VI	Tool Draftsman, Taft-Peirce Mfg. Co., Woonsocket, R. I.
Lord, Wilfred	IIb	See Evening, 1901.
xMason, Frederick A.	Ia	Mule Spinner, Saxony Worsted Mills, Newton, Mass.
Moir, Alexander L.	P. G. IIIa	See Evening, 1899.
Mortenson, Carl W.	IIIa	Automobile Dealer, Evans & Mortenson, No. Billerica, Mass.
*Mozley, Arthur	VI	
Myers, James W.	IIIa-IV	Assistant Superintendent, U. S. Bunting Co., Lowell, Mass.

Name	Course	Occupation
Nicholson, Richard	IIb	Section Hand, Washington Mills, Lawrence, Mass.
xNoonan, Denis T.	IIIa	Assistant Superintendent, Knoxville Woolen Mills, Knoxville, Tenn.
Palmer, G. Buel	IIIa	Solicitor, American Wool & Cotton Reporter, Boston, Mass.
xRockwell, Henry D.	IIa	Clerk, Davis and Furber Machine Co., No. Andover, Mass.
xSchofield, John S.	IIIa	Assistant Superintendent and Designer, Lawrence Keegan Mill, Wiltonville, Conn.
Schoon, Fenton	IIb	Section Hand, Worsted Drawing, Farr Alpaca Co., Holyoke, Mass.
Stokham, Burton I.	IV	Chemist, Bigelow Carpet Company, Lowell, Mass.
xTonge, Matthew	IIIa	Weaver, Dartmouth Mfg. Co., New Bedford, Mass.
Upton, Frank A.	Ia	Assistant Superintendent, Renfrew Mfg. Co., Adams, Mass.
Varney, Manley H.	Ia	See Evening, 1902.
Walker, David	P. G. IIIa	See Evening, 1902.

Day Course, 1904

Diploma Graduates

Abbott, Edward M.	II	Vice-President and Agent, Abbott Worsted Co., Graniteville, Mass.
Baldwin, Frederick A.	II	Vice-President and Secretary-Treasurer, Walter Blue & Co., Ltd., Sherbrooke, P. Q., Canada.
Clapp, F. Austin	II	Insurance Agent, N. E. Mutual Life Insurance Co., New York City.
Clogston, Raymond B.	IV	Superintendent, Farwell Bleachery, Lawrence, Mass.
Culver, Ralph F.	IV	Manager, Dyeing Departments, J. R. Bancroft & Sons Co., Wilmington, Dela.
xCutler, Benjamin W., Jr.	III	With W. H. Hinchman and Co., New York City.
Dewey, James F.	II	Superintendent, Dewey's Mills, Quechee, Vt.
Donald, Albert E.	II	Assistant Superintendent, Uxbridge Worsted Co., Uxbridge, Mass.
Jury, Alfred E.	IV	Chemist, Wells and Richardson Company, Burlington, Vt.
Lucey, Edmund A.	II	Industrial Engineer, H. L. Gantt, New York City.
MacPherson, Wallace A.	III	First Assistant Designer, National & Providence Worsted Mills, Providence, R. I.
Meadows, William R.	I	Assistant Instructor, Carding and Spinning, Clemson Agricultural College, Clemson College, S. C.
Stevens, Dexter	I	Vice-President and General Manager, Necronsett Mills, Philadelphia, Pa.
Webb, Frank H.	IV	Chemist, Washington Mills, Lawrence, Mass.

Name	Course	Occupation
White, Royal P.	II	Superintendent, Stirling Mills, Lowell, Mass.

Certificate Holders

xHalsell, Elam R.	I-V	Overseer of Carding, Warren Mfg. Co. West Warren, Mass.
Horsfall, George G.	II-III-V	Assistant Dyer, Interwoven Mills, Inc., Martinsburg, W. Va.
Jones, Everett A.	III	Superintendent, Nye and Wait Carpet Co., Auburn, N. Y.
xO'Donnell, John D.	I-V	Clerk, Travers Bros. Co., New York City.
xO'Hara, William F.	IV	Chemist, Arthur Merritt, Boston, Mass.
Parker, Everett N.	I-III-V	With Parker Spool and Bobbin Company, Lewiston, Me.
Smith, Ralston F.	I	Sales Manager, The Corday and Gross Co., Cleveland, Ohio.
xToovey, Sidney E.	V	Pattern Dresser and Weaver, Talbot Mills, No. Billerica, Mass.
*Wilson, Walter E. H.	I-V	

Evening Course, 1904

Certificate Holders

Adams, Michael E.	VI	Local Manager, Lowell Storage Warehouse Co., Lowell, Mass.
Balmforth, James H.	IIa-b	See Evening, 1903.
xBalmforth, William F.	VI	No. Billerica, Mass.
xBarker, John P.	V	Peacedale, R. I.
Barrington, John A.	IV	Manager, Kalle & Co., Philadelphia, Pa.
xBoucher, John L.	VI	Lowell, Mass.
xButler, Benjamin O.	VI	Lowell, Mass.
xCallahan, Patrick A.	VI	With Lower Pacific Mills, Lawrence, Mass.
Cheetham, John Joseph	Ia	Second Hand, Massachusetts Cotton Mills, Lowell, Mass.
Conley, Frederick A.	VI	Picker Expert, Saco-Lowell Shops, Kitson Plant, Lowell, Mass.
Connors, Edward F.	VI	Draftsman, Locks and Canals, Lowell, Mass.
Davis, Prentice T.	Ia	Overseer, D. Mackintosh & Sons Co., Holyoke, Mass.
xDelmage, Edward R.	IIIa	Overseer Weaving, Thos. Kent Mfg. Co., Clifton Heights, Pa.
Dempsey, John W.	IIa	Ayer, Mass.
xDonahue, Michael F.	VI	Boston, Mass.
Doole, George L.	VI	Clerk, U. S. Bunting Co., Lowell, Mass.
Dooley, Edward W.	VI	Sign Writer, The Kimball System, Lowell, Mass.
Duggan, Francis P.	VI	Third Hand, U. S. Cartridge Co., Lowell, Mass.
Frank, Emil M.	IIIa	Cloth Inspector, Ayer Mills, Lawrence, Mass.
Gaunt, Alfred C.	IIb	See Evening, 1899.
xHempel, Frank	V	Signal Dept., Boston & Maine Railroad, Lawrence, Mass.
Higgins, James A.	IIa-b	See Evening, 1903.

Name	Course	Occupation
Hoyle, Joseph	I Ib	Overseer, U. S. Worsted Co., No. Chelmsford, Mass.
Jeannotte, Arthur	VI	With Heinze Electric Co., Lowell, Mass.
xKershaw, William E.	V	Weaver, Talbot Mills, No. Billerica, Mass.
Langevin, Felix D.	VI	Superintendent, Kitson Division, Saco-Lowell Shops, Lowell, Mass.
xLord, Harry D.	IIIa	Lowell, Mass.
Lord, Wilfred	IIa	See Evening, 1901.
xMcBride, Robert G.	IIa	Mule fixer, Merrimack Woolen Mills, Lowell, Mass.
Merrill, Edwin C.	VI	Draftsman, Eng. Dept., City Hall, Lawrence, Mass.
Miller, Emil H.	V	Charge of Supply Dept., Lower Pacific Mills, Lawrence, Mass.
Moorehouse, Thomas	VI	Electrician, Everett Mills Power Station, Lawrence, Mass.
Murphy, John H.	VI	Secretary, Board of Trade, Lowell, Mass.
Notman, Frederick W.	Ia	Clerk, Massachusetts Cotton Mills, Boston, Mass.
xPatrick, Alexander	IIIa	Omaha, Neb.
Redman, Henry S.	IIIa	Assistant Superintendent, Appleton Co., Lowell, Mass.
xReed, Foster C. K.	VI	Steam Engineer, Farwell Bleachery, Lawrence, Mass.
xRhodes, Joseph E.	V	Chicago, Ill.
Rooney, George W.	Ia	Superintendent, Cotton Yarn Mill, N. H. Spinning Mills Co., Penacook, N. H.
Shaw, James	V	Loomfixer, Lowell, Mass.
Smith, Edward	Ia	Fall River, Mass.
Smith, John W.	I Ib	Automobile Machinist, Peerless Motor Car Company of New England, Boston, Mass.
xSterling, Walter	IIIa	New Bedford, Mass.
Stokham, Burton I.	P. G. IV	See Evening, 1903.
xTarpey, John F.	IIa	With Merrimack Mfg. Co., Lowell, Mass.
Thompson, Charles B.	VI	Clerk, B. and M. Railroad, Lowell, Mass.
Webb, Francis H.	V	With Frank E. Bassett, Lowell, Mass.

Day Course, 1905

Diploma Graduates

Adams, Henry S.	I	See Evening, 1903.
Boyd, George A.	I	Accountant, Harmony Mills, Boston, Mass.
Carr, George E.	I	Foreman, Wyoming Valley Lace Mills, Wilkesbarre, Pa.
Cole, James T.	II	Superintendent, Industrial Dept., Mass. Commission for Adult Blind, Cambridge, Mass.
xDillon, James H.	III	With Walworth Bros., Boston, Mass.
Harris, Charles E.	I	President and General Manager, Harris Garage and Machine Co., Easthampton, Mass.
Hollings, James L.	I	Investigating Examiner of Cottons, U. S. Appraisers Dept., New York City.
Hook, Russell W.	IV	Analytical Chemist, Arthur D. Little, Inc., Boston, Mass.

Name	Course	Occupation
Jones, Everett A.	III	See Day, 1904.
Lewis, Walter S.	IV	Assistant Physicist, Bureau of Standards, Washington, D. C.
McKenna, Hugh F.	IV	Chemist, United Indigo and Chemical Co., Ltd., Chicago, Ill.
Midwood, Arnold J.	IV	Salesman, Levinstein and Company, Boston, Mass.
Moore, Everett B.	I	Manager and Buyer, Chadbourne and Moore, Chelsea, Mass.
Parker, Everett N.	I	See Day, 1904.
xThompson, Everett L.	I	Treasurer, The Direct Hosiery Co., Boston, Mass.
Warren, Philip H.	II	Superintendent, Hopeville Mfg. Co., Worcester, Mass.
Wheelock, Stanley H.	II	Superintendent, Stanley Woolen Company, Uxbridge, Mass.

Certificate Holders

Arundale, Henry B.	II-III-V	Director, Textile School, So. Manchester, Conn.
Conklin, Jennie G.	IIIb	Commercial Designer, Boston, Mass.
Curtis, William L.	II	With G. E. & H. F. Habich Co., Boston, Mass.
xHunt, Chester L.	III	Machinist, United Shoe Machinery Co., Beverly, Mass.
Lee, William H.	V	Overseer, Lee's Wool Shop, Holyoke, Mass.
Roberson, Pat H.	I	With James R. Roberson and Son, Cropwell, Ala.
Roberts, Carrie I.	IIIb	Designer, Lowell, Mass.
xThomas, Roland V.	I	Lowell, Mass.
Wright, Edward, Jr.	II	Sanitary Engineer, Mass. State Board of Health, Boston, Mass.

Evening Course, 1905

Certificate Holders

xBake, Herbert	IIIa	Designer, Walworth Brothers, Lawrence, Mass.
Bastow, Henry	V	See Evening, 1903.
Bell, Frederick W.	IIa	With Bay State Mills, Lowell, Mass.
Bowie, Samuel A.	VI	Chief Engineer, Pacific Mills, Lawrence, Mass.
Brown, James P.	IIIa	Insurance Agent, Metropolitan Life Insurance Co., Lowell, Mass.
Bryant, Ernest L.	VI	Clerk, C. A. Templeton, Inc., Waterbury, Conn.
xBurke, Thomas F.	Ia	Lowell, Mass.
Burns, Edward J.	IV	Tester, U. S. Cartridge Company, Lowell, Mass.
Burns, James E.	IV	Overseer, Testing Dept., U. S. Cartridge Co., Lowell, Mass.
Caron, Cleophas	I	Overseer, Ring Spinning Dept., Queen City Cotton Co., Burlington, Vt.
Collins, John A.	IIa-b	Secretary, Mutual Boiler Insurance Company, Boston, Mass.

Name	Course	Occupation
Cook, Cheney E.	IIIa	Manager, Winslow Bros. and Smith Company, Norwood, Mass.
Custer, James J. E.	V	Letter Carrier, Lowell, Mass.
Dana, Clarence A.	VI	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Dick, Hugo P.	IIIa	Designer, Tilton Mills, Valley Falls, R. I.
*Dimlick, Benjamin C.	IIIa	
Erbe, Gustave	VI	Foreman, J. L. Thomason Mfg. Company, Waltham, Mass.
xFoster, Sherwood L.	Ia	With Lowell Brass Foundry, Lowell, Mass.
xFrench, Ernest J.	Ia	Clerk, Upper Pacific Mills, Lawrence, Mass.
xGay, Earle B.	Ia	Second Hand Carding, Dana Warp Mills, Westbrook, Me.
Goodchild, George	VI	See Evening, 1903.
Harder, Elmer E.	VI	Janitor, Highland School, Lowell, Mass.
Haven, George W.	IIIa	Of Blake and Stearns, Boston, Mass.
Howard, Thomas	V	Overseer, T. Martin and Bro. Mfg. Co., Lowell, Mass.
xHunt, Herbert R.	VI	Assistant Draftsman, DeLamar's Copper Refining Co., Chrome, N. J.
xHunton, Lewis G.	IV	Shipping Clerk, C. I. Hood Co., Lowell, Mass.
xKenworthy, Joseph	Ia	Second Hand, Boott Mills, Lowell, Mass.
Kimball, Irving D.	VI	Patent Dept., Saco-Lowell Shops, Lowell, Mass.
Lamson, George F.	VI	See Day, 1900.
xLinkletter, Alfred C.	VI	Linkletter, P. E. I.
xLovell, Charles E.	VI	Los Angeles, Cal.
xMcManus, Hugh	V	With Middlesex Co., Lowell, Mass.
Maguire, James H.	VI	Foreman, Erecting, Saco-Lowell Shops, Lowell, Mass.
Martin, John C., Jr.	IIa-b	Tailor, J. C. Martin & Sons, Lowell, Mass.
Molloy, Andrew	IIIa	See Evening, 1902.
O'Neill, Peter F.	IV	Warp Dyer, Arlington Mills, Methuen, Mass.
xOverend, John	V	Hand Dresser, Arlington Mills, Lawrence, Mass.
Redman, Henry S.	V	See Evening, 1904.
Silk, Frederick C. M.	IV	Color Passer and Pattern Starter, Bigelow Carpet Co., Lowell, Mass.
xSimola, Emil J.	Iia-b	Finland.
xSkinner, Clarence W.	IIIa	With Brightwood Mfg. Co., No. Andover, Mass.
Smith, Arthur	IIIa	Designer, Pemberton Mills, Lawrence, Mass.
Smith, George A.	IIIa	Superintendent, Tremont Worsted Co., Methuen, Mass.
Smith, William E.	IIIa	Clerk, Kennedy & Co., Lawrence, Mass.
Stevens, Frank W.	VI	Assistant Engineer, Locks and Canals, Lowell, Mass.
Stopherd, William H.	IIIa	See Evening, 1899.
Tonge, John	IV	Salesman, Dyestuffs and Chemicals, Read, Holliday & Sons, Ltd., Providence, R. I.

Name	Course	Occupation
Wilde, Thomas E.	IIa	Proprietor, Jeremiah Clark Machine Co., Lowell, Mass.
Wiswall, Frank T.	V	Cost Clerk, Geo. E. Kunhardt, Lawrence, Mass.

Day Course, 1906

Diploma Graduates

xAvery, Charles H.	II	With Mauger & Avery, Boston, Mass.
Bradford, Roy H.	II	Assistant Superintendent, Smith and Dove Mfg. Company, Andover, Mass.
Churchill, Charles W.	III	Vice-President and Treasurer, The Granby Elastic Web Co., Ltd., Granby, Quebec, Canada.
Cole, Edward E.	IV	Reporter, Bradstreet Co., Haverhill, Mass.
Currier, Herbert A.	I	Cotton Yarn Salesman, William Whitman & Co., New York City.
Curtis, Frank M.	I	Salesman, Wm. Curtis Sons Co., Boston, Mass.
Fleming, Frank E.	IV	Asst. Dyer and Finisher, Goodall Worsted Co., Sanford, Me.
Gahm, George L.	II	Superintendent, Wood Worsted Mills, Lawrence, Mass.
Hennigan, Arthur J.	II	New England Representative, Talbot Mills, Boston, Mass.
Swan, Guy C.	II	Student, Stanford University, Palo Alto, Cal.
Varnum, Arthur C.	II	Assistant Superintendent, Stirling Mills, Lowell, Mass.
Wightman, William H.	IV	Salesman, Farbenfabriken of Elberfeld Co., Boston, Mass.
Wood, Herbert C.	I	Overseer, Carding, Tremont and Suffolk Mills, Lowell, Mass.

Certificate Holders

xChurch, Charles R.	II-V	Physical Director, Y. M. C. A., Methuen, Mass.
Gillon, Sara A.	IIIb	Designer, Lowell, Mass.
Hildreth, Harold W.	II-V	Section Hand, Arlington Mills, Lawrence, Mass.
xHintze, Thomas F.	I	New York City.
Kent, Clarence L.	III-V	Insurance Agent, Mass. Mutual Life Ins. Co., Lawrence, Mass.
Lane, John W.	I	With Everett Mills, Lawrence, Mass.
xMcDonnell, William H.	I-V	South Boston, Mass.
Newcomb, Guy H.	IV	Mgr. Badische Co., San Francisco, Cal.
Reynolds, Isabel H.	P. G. III-V	See Day, 1903.
Stohn, Alexander C.	III-V	Textile Operator, C. Stohn, Hyde Park, Mass.
Woodruff, Charles B.	V	Traveling Salesman, Hargadine-McKittrick Dry Goods Co. of St. Louis, Mo., Birmingham, Ala.

Evening Course, 1906

Certificate Holders

Name	Course	Occupation
Abbott, Paul W.	Ia	Chief Inspector, Cadillac Motor Car Co., Detroit, Mich.
xAmiot, Louis H.	Va	American Hide and Leather Co., Lowell, Mass.
Armstrong, Elias B.	IIb	With Wellington, Sears & Co., Boston, Mass.
Bake, Herbert	P. G. IIIa	See Evening, 1905.
Brouder, John J.	IIIa	Designer, Ayer Mills, Lawrence, Mass.
Brown, James P.	P. G. IIIa	See Evening, 1905.
Brown, William G.	IIb	President, Geo. C. Moore Wool Scouring Mills and Brookside Worsted Mills, No. Chelmsford, Mass.
Burgess, Joseph H.	Va	Cloth Inspector, Arlington Mills, Lawrence, Mass.
Burnham, Joseph W.	IIIa	Designer, Lincoln Mills, Pascoag, R. I.
Burnham, Wilmont V.	Vb	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Dick, Hugo P.	P. G. IIIa	See Evening, 1905.
xDickson, Andrew	IIa	Asst. Shipping Clerk, Coronet Worsted Co., Mapleville, R. I.
*Dimlick, Benjamin C.	P. G. IIIa	
Dodge, Frank	Ia	Overseer, Hamilton Co., Lowell, Mass.
Duce, Benjamin	IIIa	Overseer, Weaving, Ayer Mills, Lawrence, Mass.
Ellis, George W.	VII	Superintendent, A. D. Ellis & Sons, Monson, Mass.
xEyers, John T.	IV	Second Hand, Dyehouse, Bay State Mills, Lowell, Mass.
Frank, Emil M.	P. G. IIIa	See Evening, 1904.
xFulton, John M.	V	Lowell Bleachery, Lowell, Mass.
Gregson, Robert B.	Va	Foreman, American Optical Co., Southbridge, Mass.
xHaigh, William	Vb	Boott Mills, Lowell, Mass.
Hartwell, Henry E.	VI	Student, Massachusetts College of Osteopathy, Boston, Mass.
Hoessler, Carl, Jr.	IIIa	Overseer, Weaving, M. T. Stevens & Son, No. Andover, Mass.
Howard, John	IIa	See Evening, 1900.
xHutton, Harold	V	With N. E. Bunting Co., Lowell, Mass.
xHutton, John M.	Vb	With N. E. Bunting Co., Lowell, Mass.
xInberg, Magnus	Ia	Fitchburg, Mass.
Johnson, Ernest A.	V	See Evening, 1902.
xKidd, Thomas E.	IV	Boston, Mass.
xLaffert, August W.	IIIa	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
xMcCarthy, Joseph F.	IIIa	Cloth Examiner, Wood Worsted Mills, Lawrence, Mass.
McLaughlin, Peter J.	Ia	Second Hand, Mass. Cotton Mills, Lowell, Mass.
McLay, John	Vb	Agent, Valley Worsted Mills, Providence, R. I.
Maguire, James H.	Ia	See Evening, 1905.
Michelmores, Harry	IIIa	Asst. Designer, Brightwood Mfg. Co., No. Andover, Mass.

Name	Course	Occupation
Molloy, Andrew	P. G. IIIa	See Evening, 1902.
Morton, Albert N.	IIb	Head of Department, Saco-Lowell Shops, Lowell, Mass.
xMurphy, Cornelius D.	IIa	Second Hand, N. E. Bunting Co., Lowell, Mass.
Nelson, Ernest H.	IIIa	See Evening, 1900.
O'Brien, David A.	Ia	Manager, Hall & Lyon Co., Holyoke, Mass.
Pedler, William A.	Ia	Clerk and Cotton Classer, Arlington Mills, Lawrence, Mass.
Pihl, Christian E.	VI	Master Mechanic, Appleton Mills, Lowell, Mass.
xPittendreigh, John M.	Ia	Third Hand, Merrimack Mill, Lowell, Mass.
Reardon, Timothy H.	VI	Instructor, Industrial School, Lowell, Mass.
Reynolds, Eugene A.	VI	With Lawrence Mfg. Co., Lowell, Mass.
xRichards, Francis G.	IIa	Wool Sorter, Arlington Mills, Lawrence, Mass.
Rushworth, Walter	VI	Electrician, Girard Bros., Boston, Mass.
Schubert, George J.	V	Second Hand, Pemberton Co., Lawrence, Mass.
xSenior, George	Va	Seattle, Wash.
Sharpe, John R.	VI	Overseer, Saco-Lowell Shops, Lowell, Mass.
Sheppard, Byron H.	VI	Draftsman, Jenks and Ballow, Engineers, Providence, R. I.
xSilk, Patrick E.	VII	Second Hand, Finishing, Beaver Brook Mills, Collinsville, Mass.
Skinner, Clarence W.	P. G. IIIa	See Evening, 1905.
Smith, Arthur	P. G. IIIa	See Evening, 1905.
	Va	
Smith, George A.	P. G. IIIa	See Evening, 1905.
Smith, William E.	P. G. IIIa	See Evening, 1905.
Stopherd, William H.	P. G. IIIa	See Evening, 1899.
xVogt, Harry A.	Vb	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
xWalker, William, Jr.	VII	Assistant to Superintendent, Ottaqueeche Woolen Co., No. Hartland, Vt.
Ward, James J.	VII	Pressman, Lowell Fertilizer Co., Lowell, Mass.
*Whitcomb, Harry E.	Ia	

Day Course, 1907

	Diploma	Graduates
Arundale, Henry B.	II	See Day, 1905.
Coman, James G.	I	Director, Mississippi Textile School, Agricultural College, Miss.
Craig, Albert W.	IV	In Laboratory, Pacific Mills, Lawrence, Mass.
Farmer, Chester J.	IV	Assistant Instructor, Department Biological Chemistry, Harvard Medical School, Boston, Mass.
xHaskell, Spencer H.	II	Worcester, Mass.
Hathorn, George W.	IV	Chemist, Lawrence Gas Co., Lawrence, Mass.

Name	Course	Occupation
Hildreth, Harold W.	II	See Day, 1906.
Hoyt, Charles W. H.	IV	Second Hand, Dyeing, Merrimack Mfg. Co., Lowell, Mass.
Knowland, Daniel P.	IV	Chemist, Geigy-ter-Meer, New York City.
Mackay, Stewart	III	Instructor, Textile Design and Cloth Analysis, Lowell Textile School, Lowell, Mass.
Merriman, Earl C.	II	With Samson Cordage Works, Shirley, Mass.
xRaymond, Charles A.	IV	In charge of Heating Coke Ovens, N. E. Gas and Coke Company, Everett, Mass.
xStorer, Francis E.	II	Clerk, National Shawmut Bank, Boston, Mass.
Stursberg, Paul W.	II	Superintendent, Worsted Yarn Dept., Germania Mills, Holyoke, Mass.
Woodcock, Eugene C.	II	Instructor, Woolen Yarns, Lowell Textile School, Lowell, Mass.

Certificate Holders

xBrannen, Leon V.	III-V	Philadelphia, Pa.
Ehrenfried, Jacob B.	II-V	With George Ehrenfried Co., Lewiston, Me.
Lane, John W.	I-V	See Day, 1906.
Parker, Mrs. Lotta (Meek)	IIIb	Lewiston, Me.

Evening Course, 1907

Certificate Holders

xAckroyd, Theodore C.	IIb	Chicago, Ill.
Bain, William A.	VII	Color Chemist, C. Bischoff & Co., New York City.
Bake, Herbert	VII	See Evening, 1905.
Ballinger, Frederick W.	IIb	Second Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Barber, James E.	IIb	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Barraclough, John C.	Ia	Clerk, Arlington Mills, Lawrence, Mass.
Bastow, Stephen W.	IV	Overseer of Bleaching, Winship, Boit and Co., Wakefield, Mass.
Bayard, Pierre P.	IIIa	General Manager and Director, Cie Parisienne de Roues, Puteaux, France.
xBegen, Thomas W.	IIb	Overseer, Washington Mills, Lawrence, Mass.
xBenoit, William A.	Va	Second Hand, Everett Mills, Lawrence, Mass.
xBouille, Arthur L.	Vb	Washington Mills, Lawrence, Mass.
Brannen, Leon V.	IIa	See Day, 1907.
Brouder, John J.	VII	See Evening, 1906.
xBucklitsch, Gustave J.	IIb	Overseer of Combing, Valley Worsted Mills, Providence, R. I.
Burgess, Joseph H.	Vb	See Evening, 1906.
Butterworth, Charles A.	Va	Assistant Paymaster, Suncook Mills, Suncook, N. H.
Butterworth, John A.	IIb	With J. W. Coggeshall, Providence, R. I.
Carden, Francis E.	IIb	Lowell, Mass.
Carlson, Ernest B.	IIb	Student, Lowell Textile School, Lowell, Mass.

Name	Course	Occupation
Dick, Hugo P.	IIb	See Evening, 1905.
Dobbs, William	IIb	Second Hand, Mass. Mohair Plush Co., Lowell, Mass.
Dodge, Charles P.	Ia	Machinist, C. S. Dodge, Lowell, Mass.
Duce, Benjamin	VII	See Evening, 1906.
Flint, Leon G.	IIIa	Finished Percher, Washington Mills, Lawrence, Mass.
Fr�chet�te, Alphonse J.	IIb	Clerk, W. Gendron, Lawrence, Mass.
xGillespie, James E.	VII	Wet Finishing, Brightwood Mfg. Company, No. Andover, Mass.
Gregson, Robert B.	Ia-Vc	See Evening, 1906.
Haartz, John C.	VII	President and General Manager, W. A. and J. C. Haartz, Boston, Mass.
xHaas, Ignatius	Ia	New York City.
Hamblett, Harry A.	Ia	Overseer, Merrimack Mfg. Co., Lowell, Mass.
xHanglin, Albert J.	IV	Lowell, Mass.
xHanglin, William E.	Vb	Worcester, Mass.
Hebert, Charles L. J.	IV	In business, Lowell, Mass.
Hitchen, Harry S.	Vb	Lowell, Mass.
xHitchen, Thomas G.	Vb	Manchester, N. H.
Howard, John	VII	See Evening, 1900.
xIgnatius, Pentti	Va	Appleton Co., Lowell, Mass.
Jepson, Harry	Vb	With U. S. Bunting Co., Lowell, Mass.
Kelly, Michael H.	IIIa	See Evening, 1902.
Kirsch, Alfred O.	Vb	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Laffert, August W.	VII	See Evening, 1906.
xLake, William F.	IIIa	Assistant Superintendent, Peerless Woolen Co., Rossville, Ga.
xMarjerison, T. Sydney	IIIa	Clerk, Lower Pacific Mills, Lawrence, Mass.
Martin, Willard E.	IIIa	Salesman, W. H. Gardner & Co., Boston, Mass.
Michelmores, Harry	VII	See Evening, 1906.
Myers, James W.	VII	See Evening, 1903.
Nelson, Charles E.	IIb	With Sugden Press Bagging Co., No. Chelmsford, Mass.
O'Brien, Michael F.	IIb	Bigelow Carpet Co., Lowell, Mass.
Porter, George K., Jr.	IIIa	Salesman, Wellington, Sears & Co., San Francisco, Calif.
Read, Paul A.	VII	Superintendent, Barnaby Mfg. Co., Fall River, Mass.
Redman, Henry S.	Ia	See Evening, 1904.
Ritter, Alfred E.	IIb	With Geo. H. Hadley & Co., Lawrence, Mass.
Robbins, John	IIb	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Senior, George	Ia-Vc	See Evening, 1906.
Skinner, Clarence W.	VII	See Evening, 1905.
Smith, Arthur	Vc	See Evening, 1905.
Smith, Ernest B.	Vb	Hand Warp Dresser, Multnomah Mohair Mills, Portland, Oreg.
xSmith, James	Vb	Loom Fixer, Wood Worsted Mills, Lawrence, Mass.
xSmith, Percy H.	Vb	Washington Mills, Lawrence, Mass.
Smith, William E.	VII	See Evening, 1905.

Name	Course	Occupation
Varnum, Arthur C.	Vb	See Day, 1906.
xWahlberg, Einar S.	Ia	Fitchburg, Mass.
Waterworth, Frank W.	Vb	Overseer, Ayer Mill, Lawrence, Mass.
Webb, Francis H.	IIIa	See Evening, 1904.
xWebber, John F.	IIIa	Style Man, Converting Dept., Marshall Field & Co., Chicago, Ill.
Whittaker, Thomas B.	IIb	Clerk, Arlington Mills, Lawrence, Mass.
Wiggin, Leon M.	IIIa	Designer, U. S. Bunting Co., Lowell, Mass.
Wolf, William C.	Va	Loom Fixer, Pacific Mills, Lawrence, Mass.
xWolger, John J.	IIIa	Loom Fixer, Methuen Co., Methuen, Mass.
xYare, John F.	Vb	Middlesex Co., Lowell, Mass.

Day Course, 1908

Diploma Graduates

Abbott, George R.	II	Andover, Mass.
Ballard, Horace W. C. S.	IV	Chemist, Felters Co., Millbury, Mass.
Dwight, John F., Jr.	II	Cochituate, Mass.
Farr, Leonard S.	II	Overseer, Farr Alpaca Co., Holyoke, Mass.
Gay, Olin D.	II	Superintendent, Gay Bros. Co., Cavedish, Vt.
Hadley, Walter E.	IV	Research Chemist, Roessler & Hasslach Chemical Co., Perth Amboy, N. J.
Huising, Geronimo H.	I	Examiner of Textiles, Bureau of Customs, Manila, P. I.
*Jenckes, Leland A.	VI	
Lewis, LeRoy C.	IV	Textile Expert, Bureau of Standards, Washington, D. C.
Mailey, Howard T.	II	With Lower Pacific Mills, Lawrence, Mass.
Perkins, Joshua D.	III	Overseer, Worsted Spinning, Amoskeag Mfg. Co., Manchester, N. H.
xPrince, Sylvantus C.	VI	Lowell, Mass.
Proctor, Braman	IV	Dyestuff Salesman, Badische Co., Boston, Mass.
Reynolds, Fred B.	II	Purchasing Agent, M. T. Stevens and Sons Co., No. Andover, Mass.
Robinson, Ernest W.	IV	Overseer, Belding Bros. & Co., Rockville, Conn.
Weinz, W. Elliot	IV	Chemist, American Felt Co., Boston, Mass.
Wingate, William H.	IV	Chemist, Sidney Blumenthal and Co., Shelton, Conn.

Evening Course, 1908

Certificate Holders

Arnold, Warren H.	VII	Second Hand, U. S. Bunting Co., Lowell, Mass.
Barrington, James L.	IV	Salesman, Kalle and Co., Philadelphia, Pa.
Begen, Thomas W.	IIb	See Evening, 1907.
Berry, Alfred H.	VI	Electrical Engineer, Silesia Worsted Mills, No. Chelmsford, Mass.
Broadbent, James H.	Vb	With U. S. Bunting Co., Lowell, Mass.

Name	Course	Occupation
Broadbent, William	Vb	With Merrimack Print Works, Lowell, Mass.
Brown, James T.	IIIa	Section Hand, Wood Worsted Mills, Lawrence, Mass.
Buckley, Harry	IV	Overseer, Warp Dyeing, Arlington Mills, Lawrence, Mass.
Campbell, Archibald	IV	In charge of Department, United Drug Laboratories Co., Boston, Mass.
Carden, Francis E.	I Ib	See Evening, 1907.
xCarney, William J.	Ia	Section Hand, Arlington Mills, Lawrence, Mass.
xCarter, Charles R.	Vb	Weaver, Washington Mills, Lawrence, Mass.
xCorr, Eben W.	Vb	With Prudential Life Ins. Co., Lawrence, Mass.
Corr, James F.	Vb	Loomfixer, Bay State Mills, Lowell, Mass.
Craven, Harry	VII	Clerk, Arlington Mills, Lawrence, Mass.
Dick, Hugo P.	Vb	See Evening, 1905.
Dixon, Arthur	IIIa	Loomfixer, American Woolen Co., Methuen, Mass.
Dobbs, William	I Ib	See Evening, 1907.
Dunn, George C.	IIIa	Overseer, Dyehouse, Tremont and Suffolk Mills, Lowell, Mass.
Flynn, William J.	Vb	Lowell, Mass.
Greenhalge, James	Vc	Second Hand, Indian Head Mfg. Co., Nashua, N. H.
xHallbauer, William R.	Vb	At Washington Mills, Lawrence, Mass.
Hanson, Edward	IIIa	Overseer, Merrimack Mfg. Co., Lowell, Mass.
xHardman, David B.	IV	Machine Printer, Pacific Mills, Lawrence, Mass.
xHarris, Louis	VII	Assistant to Clothing Designer, J. Peavey and Bros., Boston, Mass.
Hennessey, Ambrose M.	VII	Inspector of Transformers, General Electric Co., Pittsfield, Mass.
Hill, Harold	Ia	Section Hand, Arlington Mills, Lawrence, Mass.
xHoellrich, Martin J.	Vb	With Wood Worsted Mills, Lawrence, Mass.
Ingham, Benjamin W.	Ia	Overseer, Boott Mills, Lowell, Mass.
xLagerbald, Jarl	VII	Asst. Chemist, Wood Worsted Mills, Lawrence, Mass.
Lake, William F.	P. G. IIIa	See Evening, 1907.
McGill, William E.	VII	Second Hand, Linn Woolen Co., Hartland, Me.
xMcGovern, James	VII	Cloth Inspector, Arlington Mills, Lawrence, Mass.
McKenna, Jerimiah J.	Vb	With Merrimack Woolen Co., Dracut, Mass.
Maker, Isaac A.	Ia	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Marjerison, T. Sydney	P. G. IIIa	See Evening, 1907.
Marshall, Fred K. R.	VI	Electrician, Arlington Mills, Lawrence, Mass.
Mortenson, Carl W.	I Ia	See Evening, 1903.
Nutter, James R.	VI	With Merrimack Mfg. Co., Lowell, Mass.
*Osbeck, William J.	IIIa	

Name	Course	Occupation
Patterson, Alfred H.	IIIa	Clerk, Lower Pacific Mills, Lawrence, Mass.
Perkins, Thomas, Jr.	Ia	Superintendent, Chicopee Mfg. Co., Chicopee Falls, Mass.
Picken, William T.	IIIa	Purchasing Agent and Paymaster, Silesia Worsted Mills, No. Chelmsford, Mass.
Plumer, Paul T.	Vb	Pattern Weaver, U. S. Bunting Co., Lowell, Mass.
Porter, George K., Jr.	P. G. IIIa	See Evening, 1907.
Preble, George A.	IIIa	Overseer, Massachusetts Cotton Mills, Lowell, Mass.
Saalfrank, Joseph C.	IIIa	Chief Clerk, Top. Mill Dept., Arlington Mills, Lawrence, Mass.
Scally, Edward	VI	With Wm. Scally, Lowell, Mass.
Schermerhorn, George E.	Va	See Evening, 1902.
Schuster, William F.	VII	Second Hand, Washington Mills, Lawrence, Mass.
Seddon, N. Graham	IIIa	Manager, Einstein Mfg. Co., Brooklyn, N. Y.
Semple, Alexander	IIIa	Student, Mt. Hermon School, Mt. Hermon, Mass.
Shackleton, J. Henry	IV	Overseer, Dyeing, Pemberton Mills, Lawrence, Mass.
Simoneau, Verner W.	VI	Student, Baltimore Medical College, Baltimore, Md.
Spurr, Albert R.	VII	Assistant Finisher, Lower Pacific Mills, Lawrence, Mass.
Spurr, James H., Jr.	IV	Assistant Bacteriologist, State Board of Health Experimental Station, Lawrence, Mass.
xStewart, Charles	Va	Weaver, Tremont and Suffolk Mills, Lowell, Mass.
Teichmann, Alfred A.	Vb	With Wood Worsted Mills, Lawrence, Mass.
Tucker, John T.	Ia	Clerk, Saco-Lowell Shops, Lowell, Mass.
Varnum, Arthur C.	P. G. IIIa	See Day, 1906.
Webber, John F.	P. G. IIIa	See Evening, 1907.
Whittaker, Thomas B.	IIb	See Evening, 1907.
Wiggin, Leon M.	P. G. IIIa	See Evening, 1907.
xWillgeroth, Henry J.	IIIa	Asst. Designer, Wood Worsted Mills, Lawrence, Mass.
Wilmot, Joseph	IIIa	Instructor, Weaving Dept., Lowell Textile School, Lowell, Mass.
Wolf, William C.	Vb	See Evening, 1907.
Wood, Jonathan	Va	See Evening, 1902.
Young, Richard, Jr.	Va	Loomfixer, Tremont and Suffolk Mills, Lowell, Mass.

Day Course, 1909

Diploma Graduates

Brainerd, Arthur T.	IV	Salesman, Farbwerke Hoechat Co., Chicago, Ill.
Conant, Harold W.	I	Cost Finder, Conant, Houghton & Co., Littleton, Mass.
Fairbanks, Almonte H.	II	Treasurer, Middlesex Knitting Co., Wakefield, Mass.

Name	Course	Occupation
Ferguson, William G.	III	Asst. Purchasing Agent, Ludlow Mfg. Associates, Ludlow, Mass.
Fiske, Starr H.	II	Assistant Instructor, Design and Weaving Dept., Lowell Textile School, Lowell, Mass.
Gyzander, Arne K.	IV	Second Hand, Faulkner & Colony Mfg. Co., Keene, N. H.
Holden, Francis C.	IV	Dyer, Carpet Yarns, Shuttleworth Bros. Co., Amsterdam, N. Y.
Kay, Harry P.	II	Foreman of Finishing, Western Felt Works, Chicago, Ill.
Laughlin, James K.	III	Traveling Salesman, Parks and Woolson Machine Co., Springfield, Vt.
Levi, Alfred S.	IV	Assistant Superintendent, Liondale Bleach, Dye and Print Works, Rockaway, N. J.
xMason, Archibald L.	VI	Foreman, Champlain Silk Mills, Brooklyn, N. Y.
Mullen, Arthur T.	II	Assistant Designer, Sutton's Mills, No. Andover, Mass.
Newall, J. Douglas	IV	Second Hand, Dyehouse, Pacific Mills, Lawrence, Mass.
Parkis, William L.	I	Boss Comber, Sharp Mfg. Co., New Bedford, Mass.
Pease, Chester C.	I	Superintendent, Yarn Mill, Shaw Stocking Co., Lowell, Mass.
Potter, Carl H.	I	Efficiency Engineer, Amoskeag Mfg. Co., Manchester, N. H.
Prescott, Walker F.	IV	With American Felt Co., Boston, Mass.
Saunders, Harold F.	IV	Chemist, Pacific Mills, Lawrence, Mass.
Stone, Ira A.	IV	Buyer, Royal Waste Co., Boston, Mass.
Wood, J. Carleton	IV	In charge Cements and Rubberized Fabrics, The Goodyear Tire and Rubber Co., Akron, Ohio.

Evening Course, 1909

Certificate Holders

Anderson, Carl A.	IV	Machinist, Lenot Motor Co., Boston, Mass.
Arnold, Warren H.	IIIa	See Evening, 1908.
xBailey, Rothwell	Va	With Mass. Cotton Mills, Lowell, Mass.
Bake, Herbert	P. G. IIIa	See Evening, 1905.
Banks, Jonas	Va	Fancy Loomfixing, Hamilton Mfg. Co., Lowell, Mass.
Barr, Mrs. John E. (Butler, Elizabeth M.)	IIIb	Lowell, Mass.
Benoit, Benjamin L.	VIb	Bookkeeper, Lowell Weaving Co., Lowell, Mass.
xBooth, Arthur	IIIa	Clerk, Arlington Mills, Lawrence, Mass.
Bowen, Herbert E.	IIIa	Overseer, Middlesex Co., Lowell, Mass.
Buckley, Richard A.	Vb	With U. S. Bunting Co., Lowell, Mass.
xBunce, Raymond H.	Vb	With Bay State Mills, Lowell, Mass.
Carman, William	Va	With Hamilton Mfg. Co., Lowell, Mass.
xChesworth, Frank K.	Va	With Everett Mills, Lawrence, Mass.
Cockell, Frederick H.	IIIa	Poultryman, J. Lord, No. Andover, Mass.
Cowdrey, Charles E.	Vb	See Evening, 1902.
xDavison, Frank L.	Vb	With Talbot Mills, No. Billerica, Mass.

Name	Course	Occupation
Dulligan, Charles E.	VIa	Overseer, U. S. Cartridge Co., Lowell, Mass.
xDunning, Carlos W.	VIb	With Appleton Co., Lowell, Mass.
Gaunt, Ernest H.	IIIa	Selling Agent, Tremont Worsted Co., New York City.
Gilinson, Philip J.	VIa	Experimental Work, Heinze Electric Co., Lowell, Mass.
Gordon, Herbert E.	IIIa	Clerk, Arlington Mills, Lawrence, Mass.
Hanson, Edward	P. G. IIIa	See Evening, 1908.
Hayes, Michael C.	IIa	In business, No. Billerica, Mass.
Hill, Harold	Va	See Evening, 1908.
Hillier, Arthur P.	IIb	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Hodgkins, Albert A.	VII	Superintendent, New Haven Web Co., Hamden, Conn.
xHolt, Harry C.	VIa	Electrician, Mass. Cotton Mills, Lowell, Mass.
xHouston, William I.	IIIa	Weaver, Washington Mills, Lawrence, Mass.
xHowell, Edward A.	Va	Loomfixer, Pemberton Mills, Lawrence, Mass.
xJoyce, John	Vc	Weaver, Merrimack Mfg. Company, Lowell, Mass.
Kaler, Harold F.	VIb	In Production Dept., General Electric Co., Lynn, Mass.
Kelley, Bernard J., Jr.	VIc	With B. Joseph Kelley, New York City.
xKershaw, Benn	Va	Second Hand, Tremont & Suffolk Mfg. Co., Lowell, Mass.
xLincourt, Henry E.	VIb	With Stover & Bean, Lowell, Mass.
McClure, Charles G.	VIb	With Heinze Electric Co., Lowell, Mass.
McLay, John	IIb	See Evening, 1906.
Madden, Peter	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
xMahoney, Dennis J.	Vb	With Talbot Mills, No. Billerica, Mass.
Molloy, Andrew	P. G. IIIa	See Evening, 1902.
Musard, Albert E., Jr.	Vc	With Merrimack Woolen Co., Dracut, Mass.
Nelson, Ernest H.	Ia	See Evening, 1900.
Orrell, Frank L.	VIb	Second Hand, Mass. Mohair Plush Co., Lowell, Mass.
Palmer, G. Buel	Vb	See Evening, 1903.
xPaquin, Joseph	VIa	Detroit, Mich.
Parsons, Joseph G.	IIIa	Pattern Weaver, Thos. Kitson & Son, Stroudsburg, Pa.
xPearson, Fred	VIa	Machinist, Saco-Lowell Shops, Lowell, Mass.
Read, Paul A.	Va	See Evening, 1907.
Robinson, Thomas	Ia	Foreman, Boott Cotton Mills, Lowell, Mass.
Ryan, Edward P.	Ia	Overseer, Tremont and Suffolk Mills, Lowell, Mass.
Schubert, George J.	IIIa	See Evening, 1906.
Schuerfeld, Harry W.	IIIa	Salesman, C. U. Thomas and Co., Boston, Mass.
Smith, Arthur	P. G. IIIa	See Evening, 1905.
Smith, George A.	VII	See Evening, 1905.
Smith, William E.	P. G. IIIa	See Evening, 1905.

Name	Course	Occupation
Stocks, Carl W.	VIa	Statistician, American Electric Railway Assn., New York City.
Stopherd, William H.	P. G. IIIa	See Evening, 1899.
*Sullivan, Humphrey F.	Ia	
Sykes, Alvin E.	VIa	Shipping Clerk, Saco-Lowell Shops, Lowell, Mass.
Tucker, John T.	Va	See Evening, 1908.
Varnum, Arthur C.	VII	See Day, 1906.
Vogt, Alfred H.	IIb	See Evening, 1902.
xWalsh, Michael L.	Ia	Section Hand, Appleton Co., Lowell, Mass.
Ware, Edward W.	IIIa	With Wellington, Sears & Co., Boston, Mass.
Watson, Luther F.	IIb	Clerk, Arlington Mills, Lawrence, Mass.
xWeigel, Frederick A.	VIb	Machinist, Pacific Mills, Lawrence, Mass.
Young, Richard, Jr.	Vc	See Evening, 1908.

Day Course, 1910

Diploma Graduates

Arienti, Peter J.	IV	Chemist, Wanskuck Co., Providence, R. I.
Cary, Julian C.	VI	With American Mutual Liability Ins. Co., Boston, Mass.
Clark, Thomas T.	II	With Talbot Mills, No. Billerica, Mass.
Duval, Joseph E.	II	Assistant Superintendent, Mass. Mohair Plush Co., Lowell, Mass.
Finlay, Harry F.	IV	Color Chemist, American Dyewood Co., New York City.
Fletcher, Roland H.	VI	Draftsman, Laconia Car Co., Laconia, N. H.
xGale, Harry L.	III	Designer, West, Baker & Co., New York City.
Goldberg, George	VI	Malden, Mass.
Hardy, Philip L.	VI	Construction Work, L. E. Locke, South Lawrence, Mass.
Howe, Woodbury K.	I	Cost Finding, Anchor Webbing Co., Woonsocket, R. I.
Hurtado, Leopoldo, Jr.	VI	General Manager, Hurtado and Co., Uruapan, Mich., Mexico.
Jelleme, William O.	I	Head of Test Department, Brighton Mills, Passaic, N. J.
Keough, Wesley L.	II	Assistant Overseer of Dyeing, Massachusetts Mohair Plush Co., Lowell, Mass.
Lamb, Arthur F.	II	With Joseph Wild and Co., Brooklyn, N. Y.
McCool, Frank L.	IV	Color Chemist, Cassella Color Co., Boston, Mass.
Manning, Frederick D.	IV	Chemist, Instar Leather Co., Garfield, N. J.
Murray, James A.	II	With Talbot Clothing Co., Boston, Mass.
Nichols, Raymond E.	VI	Draftsman, Lowell Bleachery, Lowell, Mass.
Putnam, Leverett N.	IV	Dyer, Franklin Mills, Franklin, Mass.
Reed, Norman B.	I	Investigator, Smith and Dove Mfg. Co., Andover, Mass.
Robson, Frederick W. C.	IV	Dyer, Hamilton Cotton Co., Hamilton, Ont.

Name	Course	Occupation
Smith, Doane W.	II	Designer, Somerset Woolen Co., Monson, Mass.
Smith, Theophilus G., Jr.	IV	Groton, Mass.
Stronach, Irving N.	IV	Assistant Dyer, Aberfoyle Mfg. Co., Chester, Pa.
Whitcomb, Roscoe M.	IV	Manager, Hinsdale Drug Co., Hinsdale, Mass.

Evening Course, 1910

Certificate Holders		
Anderton, Harry	Va	Loomfixer, Massachusetts Cotton Mills, Lowell, Mass.
xAtkinson, Norman	Vb	With Bay State Mills, Lowell, Mass.
Bailey, Carl E.	Ia	Assistant Superintendent, Stark Mills, Manchester, N. H.
Banks, Jonas	Vc	See Evening, 1909.
Berry, Percy W.	Vb	Finisher, Ayer Mills, Lawrence, Mass.
xBouchard, Ethan J.	Vc	Loomfixer, Merrimack Mfg. Co., Lowell, Mass.
xBourchard, Robert R.	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Burgess, Joseph H.	IIIa	See Evening, 1906.
Campbell, Edward G.	VIc	Head Draftsman, Bigelow Carpet Co., Lowell, Mass.
Christison, Hugh	IV	Chemist's Assistant, Arlington Mills, Lawrence, Mass.
Cox, Edward J.	IIIa	Cost Finder, Merrimack Mfg. Co., Lowell, Mass.
Cutress, Albert J.	VIId	Machinist, Saco-Lowell Shops, Lowell, Mass.
Deely, John A.	Vb	Pittsfield, Mass.
xDuckett, Fred I.	Vb	Section Hand, Washington Mills, Lawrence, Mass.
xDulligan, Lawrence F.	VIa	Detroit, Mich.
Dunn, George C.	IVa	See Evening, 1908.
xEklund, Louis V.	Vb	With Merrimack Woolen Co., Dracut, Mass.
Fielding, Fred	Vc	With Merrimack Mfg. Co., Lowell, Mass.
Flemings, Lester A.	Va	Paymaster, Lowell Weaving Co., Lowell, Mass.
xFlynn, John	VIId	Toolmaker, Kitson Plant, Saco-Lowell Shops, Lowell, Mass.
xFlynn, Patrick	Vb	With Bay State Mills, Lowell, Mass.
Fujiyoshi, Heisayu	Ia	Student, Graduate School of Business Administration, Harvard College, Cambridge, Mass.
Gaspar, Edith E.	IIIb	Clerk, Lawrence Hosiery, Lowell, Mass.
Gauthier, William	Vb	With Bay State Mills, Lowell, Mass.
Gookin, Alice L.	IIIb	Teacher, City of Lowell, Lowell, Mass.
Hering, Paul C.	IIIa	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Hibbert, George E.	Va	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
Hill, Ellsworth O. C.	IIb	Assistant Superintendent, Yarn Dept., Wood Worsted Mills, Lawrence, Mass.
Hilliard, William B.	VIa	Foreman, American Watch Tool Co., Waltham, Mass.

Name	Course	Occupation
Hird, Arthur W.	Ia	Overseer, Lawrence Mfg. Co., Lowell, Mass.
Hird, James A.	IVa	Chemist, B. & M. and N. Y. N. H. & H. R. R., Boston, Mass.
Hodgkins, Albert A.	IIIa	See Evening, 1909.
Hoellrich, Martin J.	Vc	See Evening, 1908.
Holt, Gavin O.	IVa	Designer, Boott Mills, Lowell, Mass.
Houston, William I.	Vb	See Evening, 1909.
Hunton, John H.	VII	Treasurer, Newichawanick Co., So. Berwick, Me.
Huttado, Leopoldo, Jr.	Vc	See Day, 1910.
Hutton, Thomas V.	Vb	Clerk, Merrimack Color Press, Inc., Lowell, Mass.
Jackson, Frank	VIb	With Monomac Mills, Lawrence, Mass.
Jean, Adhemard C.	VIa	Inspector, Line Dept., Bay State Street Railway Co., Lowell, Mass.
Jordan, Frederic W.	IV	Draftsman, Smith and Brooks, Lowell, Mass.
Jorde, Linville T.	VIc	Cable Splicing, N. E. Tel. & Tel. Co., Dover, N. H.
Kershaw, Benn	Vc	See Evening, 1909.
Kershaw, Samuel S.	IIb	Second Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Krause, George	VII	Assistant Finisher, Arlington Mills, Lawrence, Mass.
LaJeunesse, Joseph A.	IVa	Clerk, George's Shoe Store, Lowell, Mass.
Leck, Arthur J.	VII	Analyzer of Fabrics, Earl & Wilson, Troy, N. Y.
Ledoux, Blanche H.	IIIb	With A. G. Pollard Co., Lowell, Mass.
Lemire, Arthur	Ia	Foreman, Boott Mills, Lowell, Mass.
McAuliffe, Patrick D.	VIb	In Business, Lowell, Mass.
McElroy, Samuel H.	Vb	Cloth Examiner, Bay State Mills, Lowell, Mass.
Mabbett, Albert L.	IIIa	Assistant Superintendent and Designer, Newport Woolen Co., Newport, Me.
Maxcy, Leo M.	VIc	Foreman, F. E. Jewett and Co., Lowell, Mass.
xMessiah, Hiram G.	Vb	With G. A. Rogers Bakery, Reading, Mass.
Nelson, Ernest H.	Vc	See Evening, 1900.
Nelson, Gustave A.	Vb	With T. Martin and Bro., Lowell, Mass.
Nichols, Clarence W.	Vb	With Alfred Kimball Shoe Co., Lawrence, Mass.
Nicoll, John	IVa	Overseer, Smith and Dove Mfg. Co., Andover, Mass.
Paquin, Joseph	VIb	See Evening, 1909.
Pettersen, Birger	VIa	Draftsman, Lowell Bleachery, Lowell, Mass.
Phelps, Mary I.	IIIb	Teacher, City of Lowell, Lowell, Mass.
Redman, Henry S.	IV	See Evening, 1904.
Robinson, Thomas	Vc	See Evening, 1909.
Roct, Francis X., Jr.	IIIa	Loomfixer, Merrimack Mfg. Co., Lowell, Mass.
Shackleton, John H.	Ia	See Evening, 1908.
Stewart, William W.	IV	Overseer of Dyeing, Barnaby Mfg. Co., Fall River, Mass.
Stopherd, William H.	VII	See Evening, 1899.

Name	Course	Occupation
Stott, Bertram S.	Vb	Loomfixer, Geo. E. Kunhardt, Lawrence, Mass.
Stott, Samuel	IV	Second Hand, Dyeing, Arlington Mills, Lawrence, Mass.
Sullivan, Michael F.	VIb	With Merrimack Woolen Co., Dracut, Mass.
xTodd, Henry	VII	With Farwell Bleachery, Lawrence, Mass.
xWelch, Benjamin L.	VIb	Electrician, Wood Worsted Mills, Lawrence, Mass.
Whitman, William P.	IVa	With Merrimack Mfg. Co., Lowell, Mass.
Whitney, Frederick A.	IV	Dyer, John P. Boyd Co., Williamstown, Mass.
Williams, Allen R.	Ia	With Hamilton Mfg. Co., Lowell, Mass.
xWorthington, John A.	Ia	Second Hand, Merrimack Mfg. Co., Lowell, Mass.

Day Course, 1911

Diploma Graduates

Adams, Tracy A.	IV	Second Hand in Dyehouse, Pacific Mills, Dover, N. H.
Bailey, Walter J.	IV	Manager, Bailey's Cleansers and Dyers, Watertown, Mass.
Blaikie, Howard M.	II	Washington Mills, Lawrence, Mass.
Cameron, Elliott F.	IV	Second Hand, American Optical Co., Southbridge, Mass.
Chandler, Proctor R.	IV	Chemist, Loose-Wiles Biscuit Co., Boston, Mass.
Chisholm, Lester B.	I	Melrose Highlands, Mass.
Dewey, Maurice W.	II	Of Peck Brothers Co., Montpelier, Vt.
Flynn, Thomas P.	IV	Assistant Dyer, New York Mills Bleachery, New York Mills, N. Y.
Ford, Edgar R.	IV	Foreman, Saylesville Bleachery, Saylesville, R. I.
Gainey, Francis W.	IV	Assistant Chemist, Pacific Mills, Dover, N. H.
Hay, Ernest C.	II	Assistant to Treasurer, Monomac Spinning Co., Lawrence, Mass.
Hendrickson, Walter A.	II	Superintendent and Secretary, Middlesex Knitting Co., Wakefield, Mass.
Hubbard, Ralph K.	IV	With Squam Lake Woolen Co., Ashland, N. H.
Hunton, John H.	II	See Evening, 1910.
Martin, Harry W.	IV	Quality Man, Hood Rubber Co., Watertown, Mass.
Merrill, Allan B.	IV	Chemist, B. F. Goodrich Co., Akron, Ohio.
Moore, Karl R.	IV	With Wood Worsted Mills, Lawrence, Mass.
O'Connell, Clarence E.	IV	Second Hand in Dyehouse, Boston Mfg. Co., Waltham, Mass.
Pearson, Alfred H.	IV	Sanford, Me.
Rich, Everett B.	III	Hotel Accountant, Profile and Flume Hotel Co., Boston, Mass.
Sidebottom, Leon W.	IV	Second Hand, Dyehouse, Appleton Co., Lowell, Mass.

Name	Course	Occupation
Standish, John C.	IV	Chemist and Dyer, F. C. Huyck and Sons, Albany, N. Y.
Toshach, Reginald A.	II	Designer, M. T. Stevens and Sons Co., Haverhill, Mass.
Walker, Alfred S.	II	With Saxonville Mills, Saxonville, Mass.
Watson, William	III	With A. S. Campbell and Co., Boston, Mass.
Wood, Ernest H.	IV	Chemist and Salesman, Brewer and Co., Worcester, Mass.

Evening Course, 1911

Certificate Holders		
xAndrews, Oliver	Ia-Va	Loomfixer, Boott Mills, Lowell, Mass.
Ballinger, William E.	IIb	Chauffeur, G. C. Moore, No. Chelmsford, Mass.
Barnes, Joseph	Ia	Second Hand, Smith and Dove Mfg. Co., Andover, Mass.
Bastow, Percy	IVa	Warp Mercerizer, Arlington Mills, Lawrence, Mass.
Birkby, Charles H.	IVa	Overseer, Dyeing, Wallace and Smith Blanket Mills, Laporte, Ind.
Brown, William F.	VIb	Master Mechanic, U. S. Worsted Co., Lowell, Mass.
Burke, James F.	Vc	With U. S. Bunting Co., Lowell, Mass.
Carpilio, John A.	VIa	With Alfred Kimball Shoe Co., So. Lawrence, Mass.
Carty, Thomas P.	Vb	With Bigelow Carpet Co., Lowell, Mass.
Christison, Hugh	IVd	See Evening, 1910.
Cochrane, John	VIIb	Electrician, Lowell Gas Light Co., Lowell, Mass.
Cote, George W.	VIIb	With Shaw Stocking Co., Lowell, Mass.
Cox, Edward J.	Va	See Evening, 1910.
Dean, Hubert R.	VIIb	Draftsman, Arlington Mills, Lawrence, Mass.
Delaney, Michael J.	Vb	With Dumas and Co., Lowell, Mass.
xDodge, Ernest W.	Vb	Lowell, Mass.
Downs, John F.	VID	With Heinze Electric Co., Lowell, Mass.
Dulligan, Thomas	VIa	With U. S. Cartridge Co., Lowell, Mass.
Flaherty, William	Vb	With Faulkner's Mill, No. Billerica, Mass.
Fournier, Albert A.	Ia	Overseer, Renfrew Mfg. Co., Adams, Mass.
Fujiyoshi, Heisayu	Va	See Evening, 1910.
xGakidis, Alexander N.	IVa	Manchester, N. H.
Garrity, Joseph F.	VID	Machinist, Bay State Street Railway Co., Lowell, Mass.
Glennon, Edward M.	IVa	Assistant Dyer, Dana Warp Mills, Westbrook, Me.
Goodwin, Ross	Vb	With Heinze Electric Co., Lowell, Mass.
Gustafson, Alfred L.	IVa	With Automatic Refrigerating Co., Hartford, Conn.
Handley, John M.	Vb	With Musketaquid Mills, Lowell, Mass.
xHanslip, Charles W.	Vb	Saugus, Mass.
Hartwell, Marcus H.	Ia-Va	Clerk, Boott Mills, Lowell, Mass.
Heaton, Forster G.	IV	Overseer of Dyeing, Mayo Woolen Mills, Millbury, Mass.
Herrick, William E.	VII	Second Hand, Albany Felt Co., Albany, N. Y.

Name	Course	Occupation
Hibbert, George E.	Vc	See Evening, 1910.
Hodge, William	VIa	Bookkeeper, Lower Pacific Mills, Lawrence, Mass.
Kennedy, William E.	VIa	With Arlington Mills, Lawrence, Mass.
Lachance, Melina	IIIb	With A. G. Pollard, Lowell, Mass.
Lemire, Arthur	Va	See Evening, 1910.
xLinberg, Joseph F.	IVa	Mercerizer, Shaw Stocking Co., Lowell, Mass.
Logan, George H. S.	IV	Dyer, Lewando's Dyeing Co., Watertown, Mass.
McNamara, Thomas	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Manning, James B.	IVa	Dyer, Beaver Brook Mills, Collinsville, Mass.
Marsden, Phillips B.	IVa	Assistant Chemist, Arlington Mills, Lawrence, Mass.
Milot, Joseph E.	VIc	With Saco-Lowell Shops, Lowell, Mass.
Murphy, Howard H.	IIb	In business, Boston, Mass.
Nelson, James A.	Ia	Clerk, R. P. Webster, Lowell, Mass.
Nelson, Sigfred	VIId	With Saco-Lowell Shops, Lowell, Mass.
Newall, Preston	Ia	Overseer, Kosciusko Cotton Mill, Kosciusko, Miss.
Newsholme, Charles E.	VIb	Student, Wentworth Institute, Boston, Mass.
Nichol, Samuel J.	IVa	Dyer, Waterhead Mills, Lowell, Mass.
Nichols, Nathan A.	VIb	Draftsman, Saco-Lowell Shops, Lowell, Mass.
xParkin, Prescott R.	Vb	Boston, Mass.
Pedler, William A.	IVa	See Evening, 1906.
Perron, Francis J.	Vb	With Brightwood Mfg. Co., No. Andover, Mass.
Perry, Clarence R.	IIb	Assistant Superintendent, Washington Mills, Lawrence, Mass.
Racicot, Marie E.	IIIb	Lowell, Mass.
Robinson, James E.	VII	With Bay State Mills, Lowell, Mass.
Robinson, Ruddach P.	VII	Paymaster, Beaver Brook Mills, Collinsville, Mass.
Rogers, John F.	Ia	With Calumet and Arizona Smelting Co., Douglas, Ariz.
Rowlands, Haro'd	Va	Clerk, Massachusetts Cotton Mills, Boston, Mass.
Shaffer, William A.	VIId	Machinist, W. W. Carey, Lowell, Mass.
Shields, John J.	Va	With Appleton Co., Lowell, Mass.
Stanley, John R.	IIb	Second Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
xStearns, Orlo F.	IVa	With Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C.
Stewart, George	Ia-IVa	Overseer of Dyeing, Massachusetts Cotton Mills, Lowell, Mass.
Tennant, Joseph A.	VIb	In Machine Shop, Washington Mills, Lawrence, Mass.
Wade, Frank J.	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Walton, Frank L.	Ia	Traveling Salesman, Tupelo Cotton Mills, Tupelo, Miss.
Ward, Bernard D.	IIIa	Pattern Weaver, U. S. Bunting Co., Lowell, Mass.
Williams, Allen R.	Va	See Evening, 1910.

Name	Course	Occupation
Willmott, Herbert J.	VIa	Draftsman, Locks and Canals, Lowell, Mass.
xWollin, Frederick W.	Va	Utica, N. Y.
Wright, Frederick J.	Vb	With Massachusetts Mohair Plush Co., Lowell, Mass.

Day Course, 1912

	Diploma	Graduates
Bigelow, Prescott F.	II	With Eisemann Bros., Boston, Mass.
Brown, Rollins	IV	Chemist and Dyer, Farbenfabriken of Elberfeld Co., Boston, Mass.
Coan, Charles B.	IV	Dyer, Renfrew Mfg. Co., Adams, Mass.
Conant, Richard G.	I	Investigator, Brighton Mills, Passaic, N. J.
Dalton, Gregory S.	IV	Chemist, Walpole Tire and Rubber Co., Walpole, Mass.
Dearth, Elmer E.	IV	With Federal Rubber Mfg. Co., Milwaukee, Wis.
Elliot, Gordon B.	II	Salesman, Lord and Taylor Co., New York City.
Engstrom, Karl E.	VI	Instructor, Textile School, So. Manchester, Conn.
Frost, Harold B.	II	With Bigelow Carpet Co., Lowell, Mass.
Hassett, Paul J.	IV	Assistant Chemist, Sidney Blumenthal and Co., Shelton, Conn.
Holmes, Otis M.	VI	Student, Lowell Textile School, Lowell, Mass.
Hood, Leslie N.	IV	Second Hand, Dyehouse, Smith and Dove Mfg. Co., Andover, Mass.
Lamont, Robert L.	II	With M. T. Stevens and Sons Co., No. Andover, Mass.
Leitch, Harold W.	IV	Assistant Instructor, Lowell Textile School, Lowell, Mass.
Munroe, Sydney P.	I	Melrose, Mass.
Niven, Robert S.	VI	Draftsman, Crosby Steam Gage and Valve Co., Boston, Mass.
Pottinger, James G.	II	With Brown and Adams, Boston, Mass.
Roche, Raymond V.	IV	Assistant Chemist, Renfrew Mfg. Co., Adams, Mass.
Rundlett, Arnold D.	VI	With Ayer Mills, Lawrence, Mass.
Shea, Francis J.	II	With George H. Gilbert Mfg. Co., Ware, Mass.
Sullivan, John D.	VI	With H. B. Topping Co., Roslindale, Mass.
Thaxter, Joseph B., Jr.	II	Investigator, Smith and Dove Mfg. Co., Andover, Mass.
Whitehill, Warren H.	IV	Assistant Instructor, Lowell Textile School, Lowell, Mass.
Yavner, Harry	II	With S. A. Maxfield Co., Bangor, Me.

Evening Course, 1912

	Certificate Holders
Beech, Wilfred	Ia Windsor Locks, Conn.
Bernard, Joseph E.	VIId Machinist, Saco-Lowell Shops, Kitson Plant, Lowell, Mass.

Name	Course	Occupation
Blais, Emile	VIId	Machinist, Saco-Lowell Shops, Lowell, Mass.
xBlanchette, Eugene	IIIB	San Antonio, Texas.
Boije, Walter F.	IIB-VII	Designer and Draftsman, Whitin Machine Works, Whitinsville, Mass.
Brainerd, Albert C.	Ia	Second Hand, Everett Mills, Lawrence, Mass.
Brainerd, Harry C.	Ia	Second Hand, Lower Pacific Mills, Lawrence, Mass.
Bramley, Charles	Va	With Everett Mills, Lawrence, Mass.
Broderick, Thomas H.	VII	Material Clerk, Lawrence Dyeworks Co., Lawrence, Mass.
Browne, Charles D.	Ia	Paymaster, N. E. Bunting Co., Lowell, Mass.
Burke, George J.	VII	With Merrimack Woolen Co., Dracut, Mass.
Buzzell, Fred S.	IIIA	Loomfixer, Arlington Mills, Lawrence, Mass.
Carlson, Goddard O.	VII	Second Hand, Stirling Mills, Lowell, Mass.
Christenson, John O.	VIb	Student, Lowell, Mass.
Clark, John W.	IVa	Assistant Dyer, Washington Mills, Lawrence, Mass.
Daskalakis, Euthimios Z.	Vb	Loomfixer, Hamilton Co., Lowell, Mass.
Dick, Henry K.	Ia	Instructor in Knitting, Lowell Textile School, Lowell, Mass.
Dittman, Ralph A.	IIIA	Assistant Superintendent, The Glazier Mfg. Co., So. Glastonbury, Conn.
Dollbaum, John A.	IIIA	With Talbot Mills, No. Billerica, Mass.
Donahay, William H.	Vb	Chain Builder, U. S. Bunting Co., Lowell, Mass.
Dulligan, Charles E.	IVa	See Evening, 1909.
Egan, Charles H.	IVa	Oil Chemist, A. D. Little, Inc., Boston, Mass.
Freeman, Ralph W.	IVa	Lowell, Mass.
xFrothingham, Newton S.	Ia	With Merrimack Mfg. Co., Lowell, Mass.
Graves, John F.	VIb	Draftsman, Smith and Brooks, Lowell, Mass.
Greenwood, Ralph F.	VII	Assistant Superintendent, Lawrence Dye Works Co., Lawrence, Mass.
Hansen, Hans M.	VIId	Machinist, U. S. Cartridge Co., Lowell, Mass.
Hartshorn, George T.	VII	Inspector, American Felt Co., City Mills, Mass.
Hibbert, George E.	Vb	See Evening, 1910.
Higginson, Joseph H.	IIIA	Assistant Superintendent, Pentucket Mills, Haverhill, Mass.
Holland, Walter F.	IIIA	Loomfixer, Washington Mills, Lawrence, Mass.
Hutchings, James C.	VII	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Jackson, Frank	VIId	See Evening, 1910.
Jasper, Grant	Vc	With Bigelow Carpet Co., Lowell, Mass.
Kent, Arthur	VIb	Machinist, Saco-Lowell Shops, Lowell, Mass.
Kerrigan, Arthur J.	VIa	Draftsman, Saco-Lowell Shops, Lowell, Mass.

Name	Course	Occupation
Lambert, Harry	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
Lapierre, Alderic S.	IIIa	Second Hand, Merrimack Mfg. Co., Lowell, Mass.
LaPorte, Philip J.	IVa	Assistant Chemist, Lowell Gas Light Co., Lowell, Mass.
xLeith, Joseph E.	Vb	Sample Weaver, Massachusetts Cotton Mills, Lowell, Mass.
Lockberg, John L.	VIa	Machinist, Saco-Lowell Shops, Lowell, Mass.
Lowe, John C.	IIb	Instructor, Woolen Yarns, Lowell Textile School, Lowell, Mass.
McCann, Martin	Vb	With Merrimack Woolen Co., Dracut, Mass.
Macdonald, Chester W.	VIa	Chief Electrician, Hamilton Mfg. Co., Lowell, Mass.
Michael, Joseph C.	Vb	With Appleton Co., Lowell, Mass.
Muldoon, Joseph M.	VIb	Mechanical Draftsman, General Electric Co., Lynn, Mass.
Naylor, Charles	IVa	Pharmaceutical Chemist, C. I. Hood Co., Lowell, Mass.
Orrell, Frank L.	IIb	See Evening, 1909.
Palm, Carl H.	VIa	With Saco-Lowell Shops, Lowell, Mass.
Pihl, Ingrid I.	IIIb	Stenographer, Victor Pihl, Lowell, Mass.
Preble, George A.	Va	See Evening, 1908.
Prescott, William B.	Va	Assistant to Head of Export Department, Grinnell, Willis and Co., New York City.
Redman, Henry S.	VIa	See Evening, 1904.
Riley, Edward T.	IIIa	With Bay State Mills, Lowell, Mass.
Rollins, Henry E.	VII	Overseer of Dyeing, Nasonville Woolen Co., Nasonville, R. I.
Royds, James	Ia	Fixer, Boott Mills, Lowell, Mass.
Savage, Charles F.	IVa	Electro-plating, Middlesex Plating Works, Lowell, Mass.
Shearer, David D.	VII	With Lawrence Dye Works Co., Lawrence, Mass.
Skidmore, Russell P.	VIb	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Smith, William F.	VIa	Machinist, Bigelow Carpet Co., Lowell, Mass.
Stevens, Harold S.	IIIa	Of Stevens Shoe Co., Haverhill, Mass.
Stevenson, Robert P.	Ia	Draftsman, Tremont and Suffolk Mills, Lowell, Mass.
Sugden, Albert G.	IIIa	Designer, U. S. Bunting Co., Lowell, Mass.
Swanson, Victor E.	IVa	Carbonizer, Stirling Mills, Lowell, Mass.
Taylor, Harold S.	VIb	With Saco-Lowell Shops, Lowell, Mass.
Towers, Frederic G.	Ia	Section Hand, Pacific Mills, Lawrence, Mass.
Turgeon, Roderick	IVa	Clerk, Talbot Dyewood and Chemical Co., Lowell, Mass.
Vause, John	Va	With Pacific Mills, Lawrence, Mass.
xWard, Herbert H.	Vb	Gilbertville, Mass.
Webster, Orrin H.	Ia	Assistant Superintendent, Massachusetts Cotton Mills, Lowell, Mass.

Name	Course	Occupation
Wicks, Frederic M.	IIIa	Second Hand, Pentucket Mills, Haverhill, Mass.
Wilkinson, Joseph	IIIa	Loomfixer, U. S. Bunting Co., Lowell, Mass.
Wood, Arthur S.	Va	With T. Martin and Brothers, Lowell, Mass.

POSITIONS ATTAINED BY DAY GRADUATES 1899-1912

Directors of Textile Schools	3
Instructors, Textile or Industrial Schools	13
Mill Vice-Presidents	2
Mill Treasurers	7
Mill Agents	2
Mill Superintendents	20
Mill Assistant Superintendents	7
Mill Foremen of Departments	16
Assistants to Superintendents	2
Mill Auditors and Accountants	5
Second Hands	9
Clerks	3
Textile Designers	18
In Commission Houses	6
Wool Houses	1
Salesmen	6
Purchasing Agents	1
Managers	10
Chemists and Dyers	41
Chemical Salesmen	3
In United States Employ	5
In State Employ	1
Electricians	1
Industrial Engineers	6
Mill Engineering	10
Trade Journalists	3
In Business, Textile Distributing or Incidental thereto	7
Other Business	15
Weavers	1
Students	3
Married Women	3
Textile Manufacturing, Unassigned	16
Employment not known	19
Not Employed	3
Deceased	4

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DAY APPLICATION BLANK
THIS SHOULD BE FILLED OUT AND SENT TO THE PRINCIPAL

Lowell Textile School
LOWELL, MASS.

Date.....

Name in Full,

Date and Place of Birth,

Home Address, {
City or Town State
.....
Street and Number

Parent or Guardian,

School last attended,

DEGREE COURSES. (Course should be indicated)
I-4 Textile Engineering II-4 Chemistry and Textile Coloring
1 General Textile Option
2 Cotton Option
3 Wool Option

DIPLOMA COURSES. (Course should be indicated)
I-3 Cotton Manufacturing IV-3 Chemistry and Dyeing
II-3 Wool Manufacturing VI-3 Textile Engineering
III-3 Textile Design
(General Textile Course)

Signature,

ENDORSEMENT BY OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that.....
the above applicant has completed the regular course at the.....
High School, and has satisfactorily passed the following subjects, as specified
on pages 69-80 of Catalogue of 1913-1914, making a total of points.

REQUIRED SUBJECTS. POINTS.

ELECTIVE SUBJECTS. POINTS.

.....
.....
.....
.....
.....

Signed :

Principal..... School, located

at..... State of.....

Date.....

EVENING APPLICATION BLANK

THIS SHOULD BE FILLED OUT AND SENT TO THE PRINCIPAL

Lowell Textile School

LOWELL, MASS.

DATE.....

I, hereby
apply for admission to the Lowell Textile School as *EVENING*
student.

Name in Full,

Date and Place of Birth,

Home Address, {
City or Town State
.....
Street and Number

Parent or Guardian,

Residence of Parent or Guardian,

School last attended,

(INDICATE COURSE)

- | | |
|--|------------------------------------|
| I. Cotton Spinning. | V. Weaving. |
| II. a—Woolen Spinning. | a—Cotton Weaving. |
| b—Worsted Spinning. | b—Woolen and Worsted Weaving. |
| | c—Dobby and Jacquard Weaving. |
| III. a—Textile Design. | VI. Engineering. |
| b—Freehand Drawing. | a—Elements of Engineering. |
| IV. Chemistry and Dyeing. | b—Mechanical Drawing. |
| a—Elementary Chemistry. | c—Machine Shop. |
| b—Textile Chemistry and Dyeing. | VII. Woolen and Worsted Finishing. |
| c—Analytical Chemistry | |
| d—Textile and Analytical Chem-
istry. | |

Signature,

ENDORSEMENT BY SOME OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that
the above applicant is duly qualified to pursue with profit the
work of the Lowell Textile School.

SIGNED :

Principal School, located
at State of

Date

SERIES 17 No. 1

AUGUST, 1913

BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

FOR CATALOG AND TERMS ADDRESS CHARLES H. EAMES, PRINCIPAL

The Lowell Textile School, of Lowell, Massachusetts, was opened "for instruction in the theory and practical art of textile and kindred branches of industry," as provided by the Act under which the Trustees are incorporated, February 1, 1897, and is therefore now in its seventeenth year. It has developed during these years from small beginnings, adding departments and courses as demand arose and means permitted, until now for the first time in curriculum, housing, and equipment, it is a complete scientific textile school, as originally outlined. While constant additions demanded by a progressive industry will continue to be made, some closely identified with the production of fabrics and the supplies essential thereto, and others having for their object the broadening of the mind of the pupil, all divisions essential to thorough and complete instruction in all existing branches of textiles is now available.

Abroad the various branches of textile manufacture are separated into territorial districts and the school curriculum is confined to the specialty of the locality, the schools being substantially trade schools; one devoted to cotton, another to wool, others to worsted, weaving, spinning, dyeing, design, or chemistry, and so on. Here we find all these branches may be at the same textile centre and the school required therefore had to embrace instruction in the manipulation of all commercial fibres and all textile processes. So also in order to turn out a graduate with "lifting power" we had to include thorough instruction in the sciences applicable to the industry.

The success our graduates in the industry are achieving indicates that we correctly interpreted the need of the industry and that our instruction is comprehensive and thorough. We are unable to meet the demands from the mills, shops, laboratories, and selling houses and therefore need more day students.

The last invoice of the plant shows a value of \$679,466.57 and a pupilage day and evening of 838.

The equipment invoices \$240,692.31, the buildings \$277,583.58 with 155,478 square feet of floor space, and the site, on an elevation overlooking the falls where power weaving was first established in this country on an extensive scale, comprises about fifteen acres.

Instruction is provided for day students in the following departments:—

TEXTILE ENGINEERING

This embraces mechanical and electrical engineering, mechanism, mathematics, machine drawing, power production, transmission and application, steam, gas, hydraulics, electricity, and the construction and operation of all forms of textile machinery; also mill construction and management. Included in the equipment is an up-to-date power laboratory with a 50 H. P. Corliss engine, 50 H. P. gas engine, turbine, etc., with all the attachments and apparatus essential for boiler, engine, smoke, and gas testing, entirely distinct from the school power, heating, and ventilating plant; also a machine shop supplied with numerous lathes, milling machines, planers, vises, saws, drilling machines, wood working machinery, etc.

The instructors are graduates of the higher polytechnic institutes with large experience in their various lines. Space forbids here the details of the curriculum which covers numerous pages of the annual catalog. This will be furnished on application to Principal Charles H. Eames.

COTTON YARNS

This course includes the manipulation of cotton fibres from the raw stock to the finished yarn. The equipment is of the best makes embracing gins—saw tooth and roller—openers, beaters, lappers, eveners, etc., cards—flat and revolving—railway heads, drawing frames, fly frames, mules, stripping rolls, grinding rolls, combs, and slubbers, both warp and filling machinery from the opening of the raw stock to the finished yarns, all on a commercial scale with the incidental appliances essential to every progressive process. In this department is also a complete knitting equipment.

WOOLEN AND WORSTED YARNS

Instruction covers every process from the raw greasy wool washing, sorting, carbonizing, carding, and combing. Ample machinery for spinning both by the Bradford or English, and the French or Continental systems. In this department is also a textile yarn and fabric testing equipment to which extensive additions are now being made. The machinery of this department is also from the makers of highest repute both domestic and foreign.

DESIGN AND WEAVING DEPARTMENT

This includes instruction in form and color, historical ornament, conventionalizing of nature forms, etc. Here the scheme for the fabric is prepared, instruction then proceeding, first on hand looms and then on the power looms. The equipment includes fabric weaving on plain and fancy looms, Jacquard, carpet, plush, silk, jute, linen, in fact all commercial fibres and fabrics in wool, worsted, mohair, flax, and linen, ramie, etc. The equipment for weaving is not surpassed in variety elsewhere.

CHEMISTRY AND DYEING

The course in chemistry is now complete, organic chemistry having been recently added to the course, and it will compare favorably with that of any of the higher educational institutions. The application of the knowledge here obtained is applied in a dyeing laboratory and then on a broader scale on commercial machinery. Here is a full equipment of commercial machines for bleaching and dyeing fibres, yarns, and all varieties of fabrics to which is added laboratories for coal and oil testing, the manufacture of chemicals from rock, vegetable substances, sulphur, tar, etc., and dyes made from such elements.

FINISHING

A complete equipment for finishing wool and worsted fabrics has long been a leading feature of this department to which has been added this summer an equally complete equipment for cotton, linen, and silk finishing, thus the entire field of textile manufacture being covered.

Other sub-divisions are commercial languages, history, and physical culture.

On the recommendation of the State Board of Education a fourth year has been added to the courses in textile engineering and dyeing, the Legislature granting authority to confer degrees in these branches. Pupils can enter at the fall term for either the three year diploma course or the four year degree course, instruction being substantially the same in each course for the first three years.

Special and thorough attention is given to the physique of the pupils, as efficient working tools cannot be made out of soft iron. A competent physical director makes the necessary inspection of each pupil and is provided with a liberally equipped gymnasium and ample athletic grounds.

This is a working and not a playing school but heretofore too much work has been crowded into three years. The added fourth year will relieve the pressure and permit of more attention being given to languages, history, and to lectures on subjects that broaden the mind of youth and tend to increase his vision. Special attention will be given to mill accounting and efficiency methods in dealing with labor in general mill management.

POSITIONS HELD BY DAY GRADUATES

Director of textile school	4
Instructor textile or industrial school	11
Mill corporation treasurer	6
Mill agent	4
Mill superintendent	25
Mill assistant superintendent	7
Mill assistant manager	3
Mill foreman of department	16
Assistant to superintendent	1
Mill auditor and accountant	9
Textile examiner	3
Textile designer	16
In commission house	9
Draftsman	4
Chemist and dyer	55
In business, textile distribution or incidental thereto	5
Other business	33
Trade journalist	3
Student	3
Machinist	2
Physical director	1
Efficiency engineer	1
Industrial engineer	4
Sanitary engineer	1
Construction engineer	2
Second hand	1
Wool houses	1
Chemical salesman	6
Minor mill positions	13
Employment not known	19
Deceased	4
Total	272

SERIES 17 No. 2

NOVEMBER, 1913

BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

FOR CATALOG AND TERMS ADDRESS CHARLES H. EAMES, PRINCIPAL

Special Service Work for the Textile Industry

The primary object of the establishment of any educational institution is to give training to those who may become students. Buildings are erected, equipment procured and a corps of instructors organized to fulfill this purpose. However, in a comparatively short time after the assembling of these factors there develops with logical sequence other opportunities for the institution to extend its field of usefulness beyond the direct instruction to those who make up the student body. There are at least two methods of extending the influence and value of the institution, viz—the publication of articles, treatises and books and the investigation of new problems or the solution of special problems by members of the instructing staff.

These fields for extended usefulness are particularly evident to any technical institution or school of applied science. With the corps of trained specialists organized to meet the needs of direct instruction and the equipment at their disposal, combined with a desire to acquire new ideas or to improve existing processes, there results almost ideal conditions for special testing and original research work.

The Lowell Textile School like other schools of applied science has exerted its influence and continues to broaden the field of science applied to the textile industry. Its corps of instructors are frequently being called upon to investigate irregularities in manufacturing processes, to develop new methods that will result in increased efficiency or reduction in cost of manufacturing, or to perform original investigations. This part of the school's work known as "Special Service Work" is not confined to any one department or departments, for the problems presented are of great variety, and require the services of all. A brief description of a few of these problems will show the extent of this part of the work of the school.

For a number of years the Chemistry and Dyeing Department has made periodic tests upon new dyestuffs as they come upon the market to show their applicability to various textile fibres, and the relative value of each for special classes of work.

Samples of water, oil, coal, textile materials and a great variety of chemicals have been analyzed to determine existence of impurities, adulterants, composition or extent of applicability. Cases of irregularities in the dyeing departments of mills have been submitted to the school and a correction applied after an investigation or tests, or both.

At various times the Cotton Department has carried on series of tests for the United States Department of Agriculture to determine the spinning qualities, length of fibre, etc., of various types of cotton, which have been developed in this country. Similar tests have been made for the New York Cotton Exchange. Cotton and other fibres, which have been previously subjected to special treatment, have been handled and tested to determine the effect of such treatment.

The Woolen and Worsted Yarn Department has determined the feasibility of new processes or the new application of standard machines for wool, silk, jute, flax, hemp, ramie and other fibres. In many cases some modification of present day machinery has been necessary to satisfactorily solve the problems presented. The analysis of yarn and the detection of fibres used in a mixture is a comparative common problem to solve.

All of the manufacturing departments have had questions of irregularities or troubles in yarn or fabric manufacturing in outside textile plants submitted to them and have given great material assistance. The analysis of fabrics for design, construction or for imperfections in the manufacturing have been made at frequent intervals by the Design and Weaving Department.

In the finishing of fabrics in the regular routine of the mill defects sometimes developed the causes of which are not easily determined. The desire and at times the necessity of adapting new finishes to goods have called for some investigations and tests for manufacturing concerns under conditions where just treatment of the goods may be accorded. Our Finishing Department, comprising Cotton, Worsted and Woolen finishing machinery, has been able to give assistance to many who have presented new or difficult problems.

The Department of Engineering has been frequently consulted in regard to matters concerning the generation, transmission and measurement of power. It has been called upon to determine the efficiency of devices for transmitting power, also

the steam consumption or heating efficiency of certain textile machines. The details of building construction and the strength of materials used in mill construction have been submitted for examination and advice.

Perhaps the case which involved the greatest number of tests and largest amount of original investigation, as well as the one whose results were of greatest influence upon some of our industries, was the so-called "Mercerizing Case." The pursuance of this case involved the most thorough investigation into the phenomena of mercerization of cotton yarn. The results of the work done at the Lowell Textile School by a number of the members of the instructing staff had much to do in the winning of the suit.

The necessity of extended investigations in all branches of the industry is becoming more and more evident every year. To improve the course in testing of textile material, as well as to provide opportunity for further testing and investigation, a special laboratory is being equipped with the latest apparatus to successfully carry on this important part of the work of the school.

While this is a necessity in the fuller development of any course of textile manufacture, the value of such a laboratory in an institution of repute should be of great assistance to the industry of this state.

ANNUAL REPORT

OF THE

TRUSTEES

OF THE

LOWELL TEXTILE SCHOOL

OF

LOWELL, MASSACHUSETTS, U. S. A.

FOR SIX MONTHS ENDING

JUNE 30, 1913



BOSTON

WRIGHT & POTTER PRINTING CO., STATE PRINTERS
32 DERNE STREET

1914



ANNUAL REPORT OF THE TRUSTEES OF THE LOWELL TEXTILE SCHOOL FOR THE SIX MONTHS ENDING JUNE 30, 1913.

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled.

The trustees of the Lowell Textile School of Lowell, Mass., respectfully submit the following report for the six months ending June 30, 1913, in compliance with chapter 248, Acts of 1904, which provides: —

SECTION 1. The trustees of every textile school receiving financial aid from the commonwealth shall, on or before the thirtieth day of January in each year, make to the general court a report containing a concise statement as to the buildings, equipment and resources of the school, the courses and methods of instruction, the number of teachers and students, if any, who graduated therefrom. The report shall also contain a statement, verified by the oath of the treasurer of the school, and in such form as the auditor of accounts of the commonwealth shall prescribe, showing separately the amounts received during the previous calendar year from tuition fees, from the commonwealth, from any city or town, and from all other sources, and also showing the expenditures of the school during the same period, under the heads of maintenance, construction, and new equipment, and also the financial condition of the school at the close of said year.

Chapter 445, Acts of 1912, so amends the foregoing act as to change the fiscal year of textile school corporations from the calendar year to the school year. It reads as follows: —

SECTION 1. The fiscal year for which appropriations for textile schools shall be made and for which the treasurers of the said schools shall make their reports shall for the year nineteen hundred and thirteen begin on January first and continue to July first nineteen hundred

and fourteen; and thereafter the said year shall begin on the first day of July and shall continue until the first day of July of the succeeding year.

SECTION 2. So much of chapter two hundred and forty-eight of the acts of the year nineteen hundred and four and of chapter two hundred and eleven of the acts of the year nineteen hundred and five as is inconsistent herewith is hereby repealed.

Although the above act provides for a fiscal year of eighteen months beginning Jan. 1, 1913, and ending July 1, 1914, as the appropriations in aid of the Lowell Textile School were made separately, namely, for the six months ending July 1, 1913, this report is made for the six months ending June 30, 1913, only. Subsequent reports will, unless otherwise ordered, be for full fiscal years of twelve months each.

TRUSTEES OF THE LOWELL TEXTILE SCHOOL IN ACCOUNT WITH A. G. POLLARD, TREASURER.

LOWELL, MASS., June 30, 1913.

MAINTENANCE ACCOUNT.

Deficiency for the year 1912 brought forward, \$6,672 02
Paid for —

Teachers' salaries,	\$18,138 91	
Administration salaries,	3,080 37	
Employees' salaries,	3,730 17	
General expense,	5,895 28	
Supplies,	955 96	
Power and light,	3,286 50	
Special service,	333 62	
Chemistry deposits,	675 86	
Insurance,	418 02	
	<hr/>	\$36,514 69

Deduct ledger debits as follows: —

Cash received from —

Chemistry deposits,	\$416 61
Supplies, books sold,	410 10
Special service,	391 17
Stock sold,	121 49
Use of telephone,	5 52
Rebate of insurance,	284 34
Rent of table,	1 50

Total ledger debits, 1,630 73

Net cost of maintenance for six months, 34,883 96

Total cost including deficiency of 1912, \$41,555 98

Cash received from —

Commonwealth of Massachusetts,	\$28,000 00	
City of Lowell,	9,000 00	
Tuitions,	4,591 70	
		41,591 70

Surplus July 1, 1913,	\$35 72
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EQUIPMENT ACCOUNTS.

Chemistry and Dyeing Department, Special Equipment Account.

Balance Jan. 1, 1913,	\$2,413 27	
Balance July 1, 1913,	2,413 27	

New Equipment Account.

Balance Jan. 1, 1913,	\$32 33	
Balance July 1, 1913,	32 33	

Finishing of Cotton Fabrics Equipment Account.

Balance Jan. 1, 1913,	\$9,750 19	
Amount expended,		\$8,357 20
Balance July 1, 1913,	1,392 99	

Electrical Laboratory Equipment Account.

Balance Jan. 1, 1913,	\$2,709 98	
Amount expended,		59 11
Balance July 1, 1913,	2,650 87	

Textile Testing Equipment Account.

Balance Jan. 1, 1913,	\$2,055 95	
Amount expended,		300 00
Balance July 1, 1913,	1,755 95	

Total paid for equipment,	\$8,716 31
-------------------------------------	------------

CONSTRUCTION ACCOUNT.

Boiler House.

Balance Jan. 1, 1913,	\$146 03	
Amount received from sale of brick,	15 00	
Amount expended,		\$3,667 19
Deficiency in appropriation,	3,506 16	

Total paid for construction,	\$3,667 19
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SUMMARY OF RECEIPTS AND EXPENDITURES BROUGHT DOWN.

	Received.	Paid.
Cash on hand Jan. 1, 1913,	\$7,989 31	—
Maintenance for six months ending June 30, 1913, ¹	34,919 68	\$34,883 96
Maintenance deficiency 1912 received 1913, ¹	6,672 02	—
Equipment,	—	8,716 31
Construction,	15 00	3,667 19
	\$49,596 01	\$47,267 46

¹ Appropriated for six months ended June 30, 1913, and for deficiency in 1912 in one sum, \$28,000 (see chapter 94, Acts and Resolves of 1913).

LOWELL TEXTILE SCHOOL.

Loans,	\$20,000 00	\$20,000 00
Cash on hand June 30, 1913,	-	2,328 55
	<u>\$69,596 01</u>	<u>\$69,596 01</u>

FINANCIAL CONDITION JUNE 30, 1913.

Assets.

Land,	\$105,639 09	
Buildings,	308,181 22	
		<u>\$413,820 31</u>
Machinery and other equipment per inventory,		256,295 67
Supplies,		15,932 11
Cash on hand June 30, 1913,		2,328 55
		<u>\$688,376 64</u>

Liabilities.

Notes payable,	50,000 00
Resources,	<u>\$638,376 64</u>

Notes Payable.

Note dated Oct. 9, 1909, on demand,	\$17,500 00
Note dated March 30, 1912, on demand,	5,000 00
Note dated April 11, 1912 (balance), on demand,	7,500 00
Note dated June 1, 1912, on demand,	5,000 00
Note dated June 29, 1912, on demand,	5,000 00
Note dated April 21, 1913, on demand,	10,000 00
	<u>\$50,000 00</u>

SPECIAL TRUST FUND ACCOUNT JUNE 30, 1913.

Special Book Prize Fund.

Amount contributed by Prof. Louis A. Olney for prizes of books to honor students in chemistry and dyeing:—

Cash on hand Jan. 1, 1913,	\$85 78	
Amount received,	50 00	
Amount expended,		\$75 00
Balance on hand June 30, 1913,		60 78
	<u>\$135 78</u>	<u>\$135 78</u>

The above special fund is not included in the general account.

To the Trustees of the Lowell Textile School.

This is to certify that I have examined the books of the treasurer of the Lowell Textile School for the six months ended June 30, 1913, and find them to be correctly kept and properly vouched.

A. A. LUDWIG,
Auditor for the Corporation.

LOWELL, MASS., Jan. 10, 1914.

LOWELL, MASS., Jan. 13, 1914.

I certify that the foregoing is a correct statement of the receipts and expenditures on account of the Lowell Textile School during the six months ended June 30, 1913, and of the financial condition of the corporation at the close of said period.

ARTHUR G. POLLARD, *Treasurer,*
Trustees of the Lowell Textile School.

LOWELL, MASS., Jan. 13, 1914.

MIDDLESEX, SS.

Subscribed and sworn to before me this day.

JOHN F. SAWYER,
Justice of the Peace.

Approved as to form.
FRANK H. POPE, *Auditor.*

STATEMENT OF LAND, BUILDINGS, EQUIPMENT, RESOURCES, ETC.

LAND.

Land bounded by Standish, Riverside and Moulton streets, and
Colonial Avenue and Merrimack River, about 14 acres, . . . \$105,639 09

BUILDINGS.

Southwick Hall: 80 by 265 feet; three stories, with two-story wings and finished basement under all; cost,	\$142,120 30
Kitson Hall: 68 by 252 feet; one story and basement, and two additional floors of old boiler house, 63 by 68 feet,	46,266 07
Falmouth Street building: 192 by 80 feet; three stories with sub-basement under head house, cost,	67,211 80
Colonial Avenue laboratories; one story, 200 by 57 feet, and 60½ by 55 foot basement,	21,985 41
New boiler and engine house, with coal pockets and subway,	30,597 64
Total cost of buildings,	\$308,181 22

The floor space is occupied as follows:—

	Square Feet.
Cotton yarns and knitting,	12,000
Woolen and worsted yarns,	28,160
Decorative art,	1,446
Textile design,	15,360
Power weaving,	15,360
Chemistry and dyeing,	28,400
Finishing,	10,606
Power plant,	10,047
Mechanical and electrical engineering,	24,297
Assembly and physical culture halls,	10,800

	Square Feet.
Administration,	\$2,930
Entrances, corridors, stairways, toilets, store, locker and lunch rooms,	14,487
Total floor space,	<u>173,893</u>
Cost per square foot of floor space,	<u>\$1 77+</u>

EQUIPMENT.

Cotton yarn department,	\$33,735 15
Woolen and worsted yarn department,	45,867 69
Textile design and power weaving department,	32,408 19
Chemistry and dyeing department,	25,215 53
Textile engineering department,	33,016 63
Finishing department,	28,427 30
Corridors,	237 50
Trustees' room,	881 40
Lecture hall,	485 36
General office,	941 10
Principal's office,	746 05
Janitor's rooms,	413 88
Lunch room,	220 63
Storeroom,	206 75
Library,	2,791 13
Locker room,	556 00
Students' room,	168 00
Physical culture apparatus,	558 29
Southwick Hall,	11,495 79
Kitson Hall,	1,326 90
Weave building and head house,	4,466 80
Power plant,	15,555 15
Miscellaneous equipment,	16,574 45
Total,	<u>\$256,295 67</u>
The increase in the value of equipment is,	<u>\$15,603 36</u>
Of which was purchased,	\$8,716 31
Of which was contributed,	6,887 05
Total,	<u>\$15,603 36</u>

SUPPLIES.

Cotton yarn department,	\$216 51
Woolen and worsted yarn department,	795 88
Textile design and power weaving department,	3,423 33
Chemistry and dyeing department,	9,196 38
Textile engineering department,	150 80
Finishing department,	596 26
General office,	119 42
Principal's office,	42 35
Janitor's rooms,	44 50
Storeroom,	1,346 68
	<u>\$15,932 11</u>

COURSES OF INSTRUCTION.

CLASSIFICATION OF DAY STUDENTS BY COURSES.

	First Year.	Second Year.	Third Year.	Fourth Year.	Post- graduate.
Cotton manufacturing, . . .	6	6	3	-	-
Wool manufacturing, . . .	5	5	3	-	-
Textile design, . . .	6	2	2	-	-
Chemistry and dyeing, . . .	13	12	10	2	6
Textile engineering, . . .	21	10	7	1	8
Special course, . . .	2	-	-	-	-
	53	35	25	3	14
Total, . . .					130

CLASSIFICATION OF EVENING STUDENTS BY COURSES.

	First Year.	Second Year.	Third Year.	Post- graduate.
Cotton spinning, . . .	37	14	-	-
Knitting, . . .	7	-	-	-
Woolen and worsted spinning, . . .	51	6	6	-
Textile designing, . . .	68	20	7	-
Freehand drawing, . . .	29	7	2	2
Elementary chemistry, . . .	50	13	-	-
Textile chemistry and dyeing, . . .	2	4	4	-
Analytical chemistry, . . .	5	-	1	-
Special chemistry, . . .	2	-	-	-
Weaving (cotton), . . .	9	-	-	-
Weaving (woolen and worsted), . . .	33	-	-	-
Weaving (dobby and Jacquard), . . .	15	-	-	-
Mechanics, . . .	134	-	-	-
Steam engineering, . . .	-	21	-	-
Electricity, . . .	-	-	32	-
Mechanical drawing, . . .	50	19	4	-
Machine shop, . . .	28	16	-	2
Mathematics, . . .	50	-	-	-
Finishing, . . .	16	-	-	-
	586	120	56	4
Total, . . .				766
Names counted twice, . . .				58
Net total, . . .				708

NUMBER OF STUDENTS.

Jan. 1, 1913:—

Day classes,	130
Evening classes,	708
Total,	838

Graduated:—

Day classes,	20
Evening classes,	81
Total,	101

TEACHERS.

NUMBER BY DEPARTMENTS.

Cotton yarn,	2
Woolen and worsted yarn,	4
Textile design and weaving,	6
Chemistry and dyeing,	7
Textile engineering,	5
Finishing,	1
Language and history,	1
Physical culture,	1
Total,	27
Average number of students per teacher,	31

ROSTER OF SCHOOL OFFICERS AND INSTRUCTION CORPS.

PRINCIPAL.

Charles H. Eames, S.B., Massachusetts Institute of Technology, 1897. Experience: secretary of the Lowell Textile School and instructor in electrical engineering and mathematics; superintendent, Light, Heat and Power Company, Lowell, and engineer with Stone & Webster, electrical engineers, Boston, Mass.

INSTRUCTORS.

Textile Engineering.

George H. Perkins, S.B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member, American Society of Mechanical Engineers. Experience: draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood, Greene & Co., Boston, Mass.

Herbert J. Ball, S.B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906. Experience: draftsman, Watertown Arsenal, Watertown, Mass.; Lincoln & Williams Twist Drill Company, Taunton, Mass.

Ulysses J. Lupien, S.B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.

David M. Hunting, A.B., Harvard College, 1904; Massachusetts Institute of Technology, S.B., 1912.

Charles H. Jack, instructor in machine-shop practice. Lowell Textile School. Experience: Amoskeag Manufacturing Company, Manchester, N. H.

Chemistry and Dyeing.

- Louis A. Olney, A.C., M.S., chief instructor. Lehigh University, 1896. Experience: instructor, Brown University; dyeing and finishing department, Stirling Mills, Lowell, Mass.
- Robert R. Sleeper, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday & Sons, Limited, New York City; H. A. Metz & Co., New York City; Hamilton Print Works, Lowell, Mass.; Merrimack Manufacturing Company, Lowell, Mass.
- Howard D. Smith, Ph.D., instructor in chemistry. Tufts College, 1906; Brown University, 1904; Rhode Island College, 1901. Experience: assistant instructor, Brown University and Tufts College; instructor, Beloit College, Wisconsin.
- Russell B. Stoddard, A.B., Clark College, 1912.
- Lloyd Van Doren, Ph.D., Pennsylvania College, 1909; Johns Hopkins University, 1912.
- Harold W. Leitch, instructor in chemistry. Lowell Textile School, 1912.
- Warren H. Whitehill, assistant instructor in dyeing. Lowell Textile School, 1912.

Textile Design and Weaving.

- Hermann H. Bachmann, chief instructor. Gera Textile School, Germany. Experience: Gustav Weise Public Designing House for the city of Gera; Parkhill Manufacturing Company, Fitchburg, Mass.; Lorraine Manufacturing Company, and Smith Webbing Company, Pawtucket, R. I.
- Stewart Mackay, instructor in textile design and cloth analysis. Lowell Textile School, 1906. Experience: Bay State Mills, Lowell, Mass.; George C. Moore Wool Scouring Mills, North Chelmsford, Mass.
- Starr H. Fiske, assistant instructor in design and weaving department. Lowell Textile School, 1909. Experience: Amoskeag Manufacturing Company, Manchester, N. H.
- Joseph Wilmot, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.; Draper Company, Hopedale, Mass.; Crompton and Knowles Loom Works, Worcester, Mass.
- Albert E. Musard, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder and Ellis, Philadelphia, Pa.; Nye and Wait Carpet Company, Auburn, N. Y.
- Elizabeth Whitney, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching.

Cotton Yarns.

- Stephen E. Smith, chief instructor. Lowell Textile School, 1900. Experience: draftsman, Lowell Machine Shop, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.
- Henry K. Dick, instructor in knitting. Experience: Linville Hosiery Factory, Lanark, Scot.

Woolen and Worsted Yarns.

- Edgar H. Barker, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, Mass.; wool scouring.
- John H. Howker, instructor in wool sorting and scouring. Technical School of Saltaire near Bradford, Eng.; certificate from city and guilds of London. Experience: Saltaire Mills, Yorkshire, Eng.; Goodall Worsted Company, Sanford, Me.; Arlington Mills, Lawrence, Mass.

Eugene C. Woodcock, instructor in French spinning and woolen and worsted yarns. Lowell Textile School, 1907. Experience: Wood Worsted Mills, Lawrence, Mass.

John C. Lowe, instructor in woolen yarns. Lowell Textile School, 1911. Experience: Wood Worsted Mills, Lawrence, Mass.

Finishing.

Arthur A. Stewart, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woolen Manufacturing Company, Montreal, Can.; American Woolen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor in woolen and worsted yarns, Lowell Textile School.

CULTURAL COURSES.

Languages and History.

Lester H. Cushing, A.B., Harvard College, 1911. Experience: Lowell Textile School, Lowell, Mass.

Physical Culture.

Ralph E. Guillow, physical director. International Y. M. C. A. Training School, Springfield, Mass., 1910. Ten years' experience in physical culture in various schools and institutions.

Archibald R. Gardner, M.D., medical adviser. Harvard University, 1902.

The following reductions in instructors have occurred during the first six months of the calendar year, the period for which this report is made:—

Miles A. Moffatt, instructor in chemistry, accepted a position with the Amoskeag Company of Manchester, N. H., and Herbert C. Wood, instructor in cotton yarns, accepted a position with the Tremont and Suffolk Mills of Boston, Mass.

POSITIONS HELD BY DAY GRADUATES.

Directors of textile schools,	3
Teachers,	14
Mill vice-presidents,	3
Mill treasurers and agents,	8
Mill superintendents,	22
Mill assistant superintendents,	11
Mill foremen of departments,	12
Mill auditors and accountants,	3
Mill clerks,	2
Second hands,	8
Managers,	11
Textile designers and fabric experts,	19
In commission houses,	4
Salesmen,	8
Purchasing agents,	2
Chemists, dyers and chemical salesmen,	48
In government employ,	5
In State employ,	1

Electricians,	1
Industrial engineers,	8
Mill engineering,	9
Trade journalists,	3
In business, textile distributing or incidental thereto,	10
Other business,	13
Weavers,	1
Students,	6
Married women,	3
Textile manufacturing, unassigned,	21
Employment not known,	24
Not employed,	2
Deceased,	6
<hr/>	
Total,	291

METHODS OF INSTRUCTION.

Instruction is first given in the principles of the sciences applicable to the textile and textile machinery industries, followed by instruction in the practical art, — the application of such sciences to the processes and machinery of manufacture.

Day instruction offers five courses of three or four years, as the student may elect, namely, cotton manufacturing, wool manufacturing, textile design, — including weaving and finishing, — chemistry and dyeing and textile engineering.

All freshmen in the day classes during the first half year receive the same general instruction. At the beginning of the second half they are expected to choose one of the regular day courses. Each course, however, in addition to the specialty indicated by its name, includes some features of every other course, as such instruction, it is found, adds to the efficiency of the pupil by added breadth in the line he has chosen.

While there are several regular courses offered they may be generally grouped in three grand divisions, namely, textile engineering, chemistry and dyeing and textile design.

Textile engineering includes the mechanism of all machinery used in all departments of the school, and also machine-shop practice; instruction in the generation, transmission and application of power, whether steam, hydraulic, electrical or gas. In boiler and engine testing, for which a very complete and modern laboratory is provided, the pupils are called upon to make, or are afforded opportunities for

conducting, continuous twenty-four hour tests, boiler and plant tests, etc. This division also includes mill construction of all modern types, viz., steel and concrete masonry and wood, and combination of both, involving the laying out of plants, shafting, etc.; the use of the transit in surveying; physics as involved in the testing of fibers, yarns and fabrics; mechanical drawing; and the plans for and the construction of equipment. The pupil is first thoroughly grounded in the principles of mechanical, electrical and hydraulic engineering before attempting the more advanced and specialized problems. The higher mathematics form an important part of the work of this department. Here the plans for the school buildings are prepared, and all construction conducted during the summer vacation is by the engineers and pupils who remain for practical experience in this line of work.

Chemistry and dyeing involves a thorough course in chemistry, followed by an applied course, first in the laboratories, and finally on commercial vats, presses, kiers, dryers, etc., in raw stock, yarns and fabrics. A special and growing branch is the making of dyes from raw minerals, vegetables, oils, etc. A special laboratory is equipped for testing coal and oil.

Textile design includes, first, instruction in color, conventionalizing of nature forms, historic ornament, etc., fundamental to all branches of decorative art, and then in the application thereof to textiles. Included under this head are all fabric weaving and finishing.

Incidental to these general divisions is instruction in English, German, French and physical culture.

For evening instruction the day courses are subdivided into sixteen courses. These courses are arranged to cover substantially the same subject-matter as the day courses, but planned to meet the demand of those who wish instruction in special branches and who do not necessarily wish to pursue as complete a course as do those who attend the day classes. If an evening student wishes to cover the same subjects as are offered in the day classes he may do so, and can attain rank in a diploma course by satisfactorily passing the necessary examination.

Unlike most schools the same instructors serve day and evening, thus insuring to the evening pupils from the mills and shops the same able and thorough instruction as the day pupils, for it does not necessarily follow that the humbler youth should have a poorer school.

It has for some years been growing more and more evident that our instructors and pupils were being overworked, and had not sufficient time given in a three-year course to deal with some advanced specialties. A postgraduate course was established to relieve the situation, for which has been substituted a regular four-year course with the offer of degrees, as recommended by the State Board of Education, in textile engineering (B.T.E.) and textile dyeing (B.T.D.), the school thus passing from the technical to the technological class as originally intended. It will include more time given to present features of the curriculum and advanced work, to which are added scientific mill management, cost finding, mill accounting, general corporation organization, commercial law and usage, patent laws and practice, principles of banking, etc., useful and essential to our graduates as they advance to positions of responsibility in the textile industry. (See House Document No. 3, session of 1912.)

Most of our day pupils matriculate directly from the high schools or academies. So thorough is our instruction that they graduate directly into employment in the industry or kindred lines, and, as they rapidly advance to the higher responsibilities, they need instruction that the school has lacked time to impart. Hence, in addition to the technique of the industry is now included instruction incidental but essential to the positions they occupy or aspire to. At some technical schools and colleges it is sought to meet this need by recommending prescribed courses in reading after graduation; but this, being optional with the graduate, may or may not be given attention. By limiting these subjects to essentials and making them obligatory it is thought the pupils will more certainly be benefited.

The scientific method in mill management — with special reference to "efficiency or production engineering" as presented by Taylor, Gantt, Gilbreth, Emerson, Gunn, Richards, Cooke, Patterson and others, mostly of the eminent

Society of Mechanical Engineers — and cost finding are leading features of the fourth year now added to the three-year courses in chemistry and textile engineering.

The published works of these engineers, or papers specially prepared by them for this school, have been furnished the fourth-year pupils; and when they are grounded in the principles of this scientific method of management they are instructed in the method of applying them to textile processes, and are then required to pass an examination therein.

Mindful that pragmatism, as expounded by the late Professor James of Harvard, may from the standpoint of economics be summed up in this, that a theory is valuable only as it is found useful in application, or, more homely expressed, "the proof of the pudding is in the eating," efficiency literature is sent out to our graduates, already filling a great variety of positions, with the request that they use their eyes and brains and give us the benefit of their criticism and the problems they meet with from their various standpoints of supervision in practical manufacture.

Nearly all of our graduates go to positions that make it most important that they be fully instructed as to the latest improved methods of dealing with labor; and thoroughly trained as they are at the school in the make-up, installation and operation of machinery, they should be exceptionally capable of testing the various efficiency systems proposed. Papers already received from those out in employment and from their employers indicate that "efficiency or production engineering" has a useful place in the textile industry and will, when fully applied to all departments of a mill, result in as great benefits to employees and employers alike as has resulted in its application at the shops. Provision is now made for efficiency instruction.

Eminent efficiency engineers are gradually being called to textile mills, and there is a steadily growing demand by them for our thoroughly trained graduates to fill the various staff and division positions required to carry out their instructions as they install features of scientific efficiency methods of dealing with labor. From such staffs it is expected will eventually come an able body from which to draw managers of production.

The rapid application of electricity to textile machinery and processes calls for an extension of our electrical equipment, and the necessary equipment is being installed. Fiber yarn and fabric testing, which are so prominent features of foreign schools are also being provided for. A complete equipment of cotton finishing machinery is now in place. These additions to the plant have not yet involved any addition to our corps of instructors.

CORPORATION SUPERVISION.

An annual meeting is held in January for the election of officers, reception of annual reports and the transaction of such other business as may be proposed, not committed to the Board of Directors. Monthly meetings at the school of the trustees, sitting as a Board of Directors, are provided for. They appoint such agents, school officers and teachers as they find necessary, prescribe their duties and fix their compensation. The president (in his absence the vice-president) presides at all the meetings of the corporation and Board of Directors, and performs such other duties and exercises such other authority as the corporation or Board of Directors may from time to time devolve on him. The treasurer is charged with the general care of the pecuniary affairs and concerns of the corporation, he to receive all revenues and make all authorized disbursements. He is required to report receipts and expenditures and financial conditions quarterly to the Board of Directors, and annually to the corporation. He is also to execute all contracts made by express authority of the corporation or Board of Directors and approved by the president. He, with the president and two elected trustees, composes a finance committee which passes upon all orders for expenditures and inspects all bills before payment. No expenditure is authorized or liability incurred in excess of money available to meet it, except by vote of the Board of Directors at a meeting in the call for which due notice of the nature of such proposed expenditure or liability is given. The clerk is required to keep a record of all regular and special meetings of the corporation and Board of Directors, notify all members of such meetings seven days in advance and perform such

other duties as the corporation or Board of Directors may require of him. He is a resident trustee, devoting his time to the development work.

A corporation committee, of which the resident trustee is chairman, is charged with the organization and conduct of the nonresident postgraduate course.

In addition to the finance committee there are general committees of ways and means, building and legislative, and lectures. There is also a subcommittee for each department of the school, composed, as far as is practicable, of trustees identified in manufacturing with the specific branch of industry to which their department relates. They are to make recommendations to the Board of Directors as to the needs, etc., of their respective departments, and especially as to the new equipment, floor space, etc., and to perform such other duties as the directors may require of them.

The principal of the school is charged with its conduct, and is directly accountable to the Board of Directors, making monthly reports thereto and such recommendations and special reports as to efficiency, discipline, etc., as in his judgment are required.

CONCLUSION.

This report is for the half year from the close of the calendar year 1912, covered by our last annual report, to June 30, 1913, the beginning of our new fiscal year of twelve months, conforming in this to our school year as provided by chapter 445, Acts of 1912. (See first page of this report.)

Instead of a one-year estimate of our needs we now ask annual payments of \$60,000 for a term of ten years, such payments to cover all demands from us for maintenance, new equipment and construction. The average annual appropriation for this school for the last five years was \$65,098, excluding a deficiency for construction of \$4,615.36. The reasons for this change in estimating are fully set forth in our annual report of estimates to the Auditor of Accounts transmitted to His Excellency and printed in House Document No. 2, page 11 *et seq.*, and in our petition covering

the draft of a Senate bill providing for such annual appropriations.

Now that each division and branch of textile manufacture contemplated in the original plan for the school is substantially provided for, — though there are considerable gaps in equipment still to be filled, and we must spend annually a few thousand dollars to keep pace with invention and improved processes, — special attention is being centered upon an increase of pupils which will not involve corresponding increase in the cost of administration and maintenance. Whether we have few or many pupils, to give a complete manufacturing course in the manipulation of all commercial fibers, we must provide a sufficient number of instructors to cover instruction in all textile processes. We can handle with our present force a very much larger body of day pupils, and we shall bend all our energies to obtain them.

A leading feature of our fourth year now added to our textile engineering and chemical courses is "efficiency" in dealing specially with labor, followed with the necessary revision of cost finding. The extraordinary economic and sociological results which have followed the introduction of the Taylor System and the Gantt Bonus System into the national arsenals and larger machine shops has turned the attention of the eminent efficiency engineers, mostly of the great Society of American Engineers, to the possibilities for like results in the textile industry, and several of the larger concerns are being reorganized to conform to efficiency methods. In introducing the system the engineer first makes himself thoroughly familiar with the plant, outlines his plan, and calls for a staff of technically trained supervisors, each one being assigned to a special function. Naturally he looks to our graduates for such employees, the result being that quite a body of these are now stationed at cotton, woollen, worsted, flax and silk mills, training the operatives under the constant inspection of the engineers. In fact, we cannot supply the demand. From such corps of staff employees will naturally come the more efficient superintendents and agents of the future.

Under such supervision the ambitious operative is constantly increasing his efficiency, and increased compensa-

tion follows. The friction between the two opposing camps of employees and employers rapidly disappears, and the whole body becomes a unit, all working for the success of the concern and all sharing in such success. That the methods and instruction imparted at this school so fit into this efficiency system is evidence that we are soundly grounded on the natural law of the progress of mankind, the progress of the mass being but the sum of the progress of the individual through experience and education.

A hasty visit to most of the mills where our graduates are working under efficiency engineers only strengthened our conviction of the great importance of this work.

TOTAL RECEIPTS OF THE LOWELL TEXTILE SCHOOL FROM
ORGANIZATION TO JUNE 30, 1913.

FOR THE PLANT.	
From the Commonwealth,	\$288,331 66
From other sources — manufacturers and others,	398,866 97
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Excess of outside contributions,	\$110,535 31
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FOR MAINTENANCE.	
From the Commonwealth,	450,500 00
From city of Lowell,	\$147,000 00
From earnings (pupils' fees),	192,149 04
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	339,149 04
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Excess of Commonwealth contributions,	\$111,350 96
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AGGREGATE CONTRIBUTIONS FOR ALL PURPOSES.	
From Commonwealth brought down: —	
For plant,	\$288,331 66
For maintenance,	450,500 00
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	\$738,831 66
	<hr/>
Total Commonwealth contribution,	\$738,831 66
From other sources: —	
For plant,	\$398,867 01
For maintenance,	339,149 04
	<hr/>
	738,016 05
	<hr/>
Excess of contributions by Commonwealth for all purposes,	\$815 61

Respectfully submitted,

TRUSTEES OF LOWELL TEXTILE SCHOOL,

A. G. CUMNOCK,
President.

JAMES T. SMITH,
Corporation Clerk.

APPENDIX.

RESIDENCE OF DAY STUDENTS.

Allston, Mass.,	1	Peabody, Mass.,	1
Andover, Mass.,	5	Roxbury, Mass.,	1
Belmont, Mass.,	1	Salem, Mass.,	1
Billerica, Mass.,	1	Somerville, Mass.,	2
Boston, Mass.,	6	Stoneham, Mass.,	2
Cambridge, Mass.,	4	Taunton, Mass.,	1
Chelmsford, Mass.,	1	Waltham, Mass.,	1
Chicopee, Mass.,	1	Watertown, Mass.,	1
Clinton, Mass.,	1	Wayland, Mass.,	1
Cochituate, Mass.,	1	Webster, Mass.,	1
Concord, Mass.,	1	West Chelmsford, Mass.,	1
Danvers, Mass.,	2	West Medford, Mass.,	1
East Bridgewater, Mass.,	1	West Roxbury, Mass.,	1
Fitchburg, Mass.,	2	Wilmington, Mass.,	1
Gloucester, Mass.,	3	Winchester, Mass.,	3
Groton, Mass.,	1	Worcester, Mass.,	1
Great Barrington, Mass.,	1	Delaware,	1
Haverhill, Mass.,	3	Georgia,	1
Hudson, Mass.,	1	Illinois,	1
Hull, Mass.,	1	Maine,	7
Lancaster, Mass.,	1	Maryland,	1
Lawrence, Mass.,	10	Michigan,	1
Littleton, Mass.,	1	New Hampshire,	7
Lowell, Mass.,	17	New Jersey,	2
Malden, Mass.,	2	New York,	5
Manchester, Mass.,	1	Pennsylvania,	3
Marshfield, Mass.,	1	Rhode Island,	3
Middleborough, Mass.,	1	Texas,	1
Monson, Mass.,	1	St. John, N. B.,	1
North Adams, Mass.,	1		
North Andover, Mass.,	2	Total,	130
North Cambridge, Mass.,	1		

PREVIOUS EDUCATION, DAY STUDENTS.

High school or preparatory school,	100	Military academy,	2
College,	4	Philadelphia Textile School,	1
University,	3	Lowell Textile School,	14
Worcester Polytechnic Institute,	1	Municipal School of Technology,	
Rindge Manual Training School,	3	Manchester, Eng.,	1
Business college,	1	Total,	130

RESIDENCE OF EVENING STUDENTS.

Lowell, Mass.,	522	Forge Village, Mass.,	2
Lawrence, Mass.,	103	Arlington, Mass.,	1
Andover, Mass.,	13	Chelmsford, Mass.,	1
North Andover, Mass.,	13	Danvers, Mass.,	1
Methuen, Mass.,	13	Graniteville, Mass.,	1
North Chelmsford, Mass.,	10	Haverhill, Mass.,	1
Dracut, Mass.,	7	Tewksbury, Mass.,	1
Boston, Mass.,	5	Winchester, Mass.,	1
Ballardvale, Mass.,	4	Nashua, N. H.,	2
Collinsville, Mass.,	4		
North Billerica, Mass.,	3	Total,	708

OCCUPATION OF EVENING STUDENTS.

Apprentice,	19	Electrical worker,	4
Assistant superintendent,	8	Electrician,	10
Assistant to superintendent,	4	Engineer,	4
Back boy,	2	Filling carrier,	3
Baler,	1	Finisher,	4
Battery boy,	1	Fireman,	4
Belt boy,	1	Fixer,	8
Belt maker,	1	Floor hand,	1
Blacksmith,	1	Florist,	1
Bleacher,	2	Folder,	2
Bobbin boy,	4	Foreman,	5
Bookbinder,	1	Gauger,	1
Bookkeeper,	6	Grinder,	1
Bottler,	2	Harness looker,	5
Brewer,	1	Helper,	19
Butcher,	1	Inspector,	3
Can boy,	1	Insurance agent,	1
Carder,	6	Iron worker,	2
Carpenter,	2	Janitor,	2
Chain builder,	2	Knitter,	4
Chauffeur,	3	Laboratory assistant,	2
Chemist,	5	Laboratory technician,	1
Civil engineer,	1	Laborer,	4
Clerk,	60	Leather worker,	3
Cloth inspector,	5	Lineman,	1
Colorist,	4	Loom fixer,	14
Comberman,	1	Machinist,	52
Compositor,	1	Mechanic,	2
Cone boy,	1	Metal worker,	6
Confectioner,	1	Meter repairer,	1
Cook,	1	Milkman,	1
Cost clerk,	7	Motorman,	1
Creeler,	1	Not employed,	5
Cuff boy,	1	Office boy,	9
Designer,	5	Oil analyst,	1
Doffer,	4	Oiler,	4
Draftsman,	19	Operative,	43
Dresser,	4	Overseer,	13
Druggist,	1	Packer,	1
Dyer,	14	Painter,	1

OCCUPATION OF EVENING STUDENTS — *Concluded.*

Pattern maker,	5	Sorter,	1
Pattern weaver,	6	Spinner,	5
Paymaster,	2	Steam fitter,	5
Pentagrapher,	1	Stenciler,	1
Percher,	1	Stenographer,	1
Photographer,	1	Stone cutter,	1
Polisher,	1	Student,	67
Press hand,	2	Superintendent,	3
Printer,	5	Tailor,	1
Rodman,	2	Teacher,	6
Roll coverer,	2	Teamster,	1
Roving boy,	1	Tester,	3
Rubber worker,	1	Third hand,	4
Salesman,	9	Tool maker,	7
Sampleman,	2	Twister,	2
Second hand,	20	Warp splitter,	2
Section hand,	13	Watchmaker,	1
Shear hand,	1	Weaver,	33
Shipper,	8	Wool sorter,	2
Shoe worker,	17	Worsted drawer,	1
Sizer,	1	Yarn hand,	3
Slasher tender,	1		
Sleeve boy,	1	Total,	708
Solicitor,	1		

TRUSTEES OF THE LOWELL TEXTILE SCHOOL.

(Incorporated, 1895.)

HONORARY TRUSTEES.

FREDERICK FANNING AYER, Esq., New York City.

CHARLES H. HUTCHINS, *President*, Crompton & Knowles Loom Works.**THE CORPORATION OFFICERS, 1913.**A. G. CUMNOCK, *President*.JAMES T. SMITH, *Clerk*.JACOB ROGERS, *Vice-President*.A. G. POLLARD, *Treasurer*.**TRUSTEES.**

On the Part of the Commonwealth of Massachusetts.

Ex officiis.

His Honor EDWARD P. BARRY,
Lieutenant Governor.Dr. DAVID SNEDDEN,
Commissioner of Education.

Appointed by the Governor and Council.

FREDERICK A. FLATHER, 1916, FRANKLIN W. HOBBS, Brookline, 1914,
Treasurer, Boott Mills. Treasurer, Arlington Mills.

On the Part of the City of Lowell.

Ex officiis.

Hon. DENNIS J. MURPHY,
Mayor of Lowell.HUGH J. MOLLOY,
Superintendent of Public Schools.JAMES H. CARMICHAEL,
President Municipal Council.

By Appointment of the Lowell Textile Council.

MICHAEL DUGGAN.

PERMANENT TRUSTEES.

ALEXANDER G. CUMNOCK, Lowell, Treasurer, Appleton Company, Boston corporation, mills at Lowell.

EUGENE S. HYLAN, Lowell, Treasurer, New England Bunting Company.

ARTHUR G. POLLARD, Lowell, President, Lowell Hosiery Company.

FREDERIC S. CLARK, Boston and North Billerica, Treasurer, Talbot Mills.

Hon. FREDERICK LAWTON, Boston, Justice, Superior Court.

JAMES T. SMITH, Lowell, Attorney at Law.

WALTER E. PARKER, Lawrence, Agent, Pacific Mills, Boston corporation, mills at Lawrence.

WILLIAM M. WOOD, Andover, President, American Woolen Company, Boston office, mills at Lawrence, Blackstone, West Fitchburg, Fitchburg, Maynard, Lowell, Plymouth, Webster, Franklin, Uxbridge.

GEORGE E. KUNHARDT, Lawrence and New York, Woolen Manufacturer.

FRANK E. DUNBAR, Lowell, Attorney at Law, and President, Appleton Company, Boston corporation, mills at Lowell.

FRANKLIN NOURSE, Lowell, late Agent, Lawrence Manufacturing Company, Boston corporation, mills at Lowell.

JACOB ROGERS, Lowell, President, Tremont and Suffolk Mills, Boston corporation, mills at Lowell.

HENRY A. BODWELL, Andover, Superintendent, Smith & Dove Manufacturing Company, class of 1900.

WILLIAM E. HALL, Lowell, Treasurer, Shaw Stocking Company.

WILLIAM R. MOORHOUSE, Boston, Color Chemist, Cassella Color Company, class of 1901.

CHARLES F. YOUNG, Lowell, Treasurer, Tremont and Suffolk Mills, Boston corporation, mills at Lowell.

HON. JOHN JACOB ROGERS, House of Representatives, Washington, D. C.

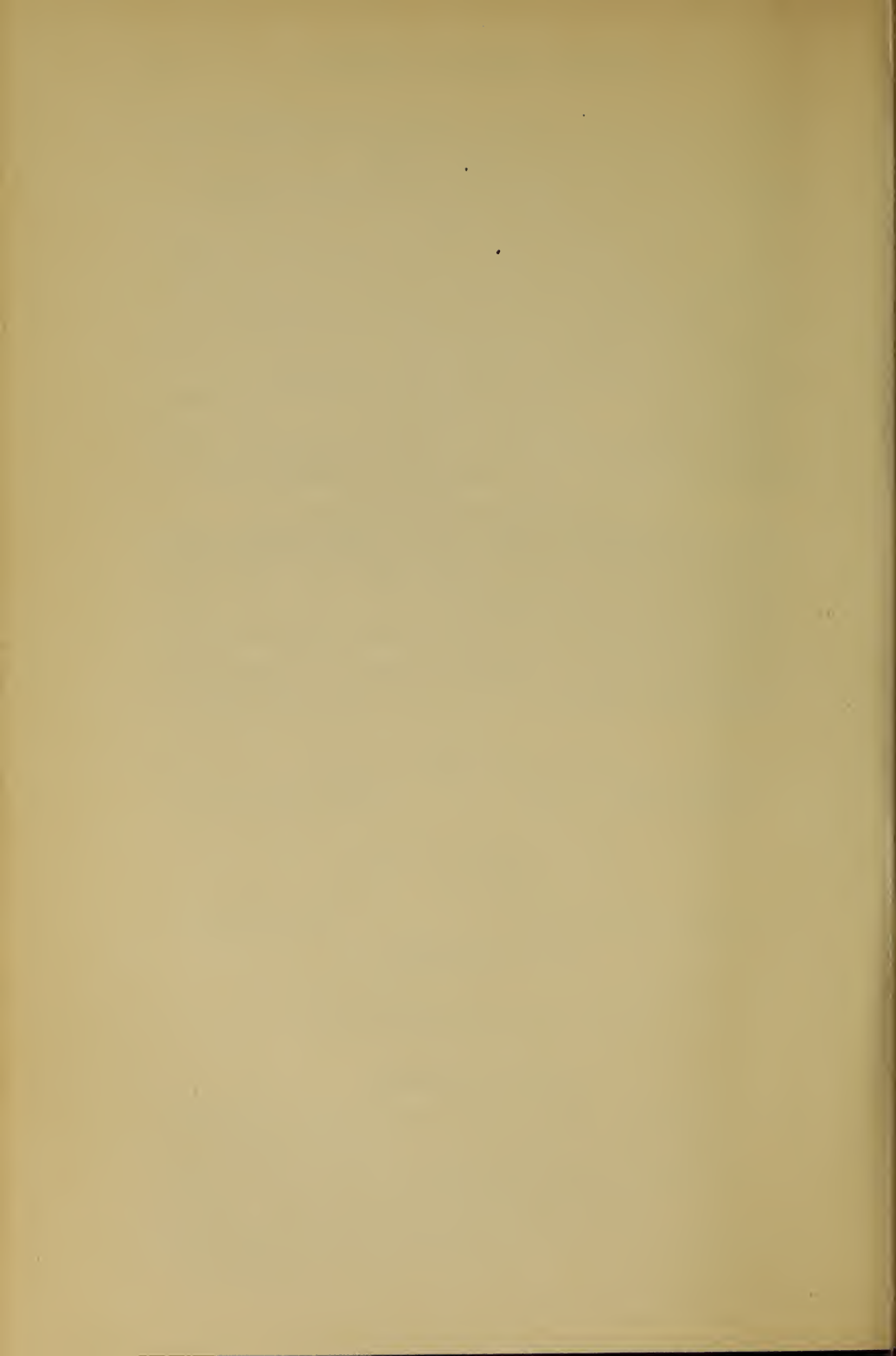
Additional Trustees elected by Alumni under Act of 1905.

For term ending June 30, 1916: DEXTER STEVENS, class of 1904, Yarn Superintendent, Necronsett Mills, Philadelphia, Pa.

For term ending June 30, 1915: T. ELLIS RAMSDELL, class of 1902, Agent, Monument Mills, Housatonic, Mass.

For term ending June 30, 1914: ROYAL P. WHITE, class of 1904, Superintendent, Stirling Mills, Lowell.

For term ending June 30, 1917: ARTHUR C. VARNUM, class of 1906, Assistant Superintendent, Stirling Mills, Lowell, Mass.







SOUTHWICK HALL

COLONIAL AVENUE BUILDING AND
FALMOUTH STREET BUILDING

SERIES 17. No. 4

May, 1914

BULLETIN

OF THE

Lowell Textile School

LOWELL, MASS.

Issued Quarterly

1914 - 1915

Entered August 26, 1902, at Lowell, Mass., as second class matter,
under Act of Congress of July 16, 1894.

Moody Street and Colonial Avenue

CALENDAR

FOR 1914

JANUARY

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FOR 1915

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DECEMBER

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CALENDAR

January—June, 1914

January 26, Mon.	Semi-annual examinations begin.
February 9, Mon.	SECOND TERM begins.
February 23, Mon.	Washington's Birthday—Holiday.
March 14, Sat.	End of first five-week period of second term.
April 18, Sat.	End of second five-week period of second term.
April 17, Fri. to April 20, Mon. inclusive	Recess.
May 6, Wed.	Certificates awarded to Evening Graduates.
May 25, Mon.	Final examinations begin.
May 30, Sat.	Memorial Day—Holiday.
June 5, Fri.	Diplomas awarded to Day Graduates.
June 15-16, Mon. and Tues., 9 A. M.	First entrance examinations.

September, 1914—June, 1915

September 8 and 9, Tues. and Wed. 9 A. M.	Second entrance examinations.
September 11, Fri.—9 A. M.	Re-examinations and examinations for advanced standing begin.
September 17, Thurs.—7 P. M.	Entrance examinations for evening students begin. They will be held on Thursday evenings until opening of classes.
September 28, Mon.	DAY SCHOOL YEAR begins.
October 5, Mon.	Evening school year begins.
October 12, Mon.	Columbus Day—Holiday.
October 31, Sat.	End of first five-week period of first term.
November 25, Wed. to November 28, Sat. inclusive	Thanksgiving Recess.
December 5, Sat.	End of second five-week period of first term.
December 23, Wed. to January 2, Sat. inclusive	Christmas Recess.
January 25, Mon.	Semi-annual examinations begin.
February 8, Mon.	SECOND TERM begins.
February 22, Mon.	Washington's Birthday—Holiday.
March 13, Sat.	End of first five-week period of second term.
April 14, Wed.	Certificates awarded to Evening Graduates.
April 17, Sat.	End of second five-week period of second term.
April 16, Fri. to April 19, Mon. inclusive	Recess.
May 24, Mon.	Final examinations begin.
May 31, Mon.	Memorial Day—Holiday.
June 4, Fri.	Diplomas awarded to Day Graduates.
June 15 and 16, Tues. and Wed. 9 A. M.	First entrance examinations.

September, 1915—January, 1916

September 7 and 8, Tues. and Wed. 9 A. M.	Second entrance examinations.
September 10, Fri.—9 A. M.	Re-examinations and examinations for advanced standing begin.
September 16, Thurs. 7 P. M.	Entrance examinations for evening students begin. They will be held on Thursday evenings until opening of classes.
September 27, Mon.	DAY SCHOOL YEAR begins.
October 4, Mon.	Evening school year begins.
October 12, Tues.	Holiday in observance of Columbus Day.
October 30, Sat.	End of first five-week period of first term.
November 24, Wed. to November 27, Sat. inclusive	Thanksgiving Recess.
December 4, Sat.	End of second five-week period of first term.
December 22, Wed. to January 1, Sat. inclusive	Christmas Recess.



KITSON HALL AND CAMPUS

SOUTHWICK HALL

Trustees of the Lowell Textile School

(Incorporated 1895)

Honorary Trustees

FREDERICK FANNING AYER,
New York City

CHARLES H. HUTCHINS,
President Crompton & Knowles Loom Works, Worcester, Mass.

The Corporation

Officers, 1914

ALEXANDER G. CUMNOCK, President JAMES T. SMITH, Clerk
JACOB ROGERS, Vice-President ARTHUR G. POLLARD, Treasurer

Trustees

On the part of the Commonwealth of Massachusetts

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Lieutenant Governor Commissioner of Education

Appointed by the Governor and Council

FREDERICK A. FLATHER, Lowell, 1916 FRANKLIN W. HOBBS, Brookline, 1914
Treasurer Boott Mills Treasurer Arlington Mills

On the part of the City of Lowell

Ex Officiis

HON. DENNIS J. MURPHY HUGH J. MOLLOY
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JAMES H. CARMICHAEL
President Municipal Council

By Appointment of the Lowell Textile Council

MICHAEL DUGGAN

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HON. JOHN JACOB ROGERS, House of Representatives, Washington, D. C.

Additional Trustees Elected by Alumni Under Act of 1905

For Term Ending June 30, 1914:
ROYAL P. WHITE, Class of 1904, Superintendent, Stirling Mills, Lowell, Mass.
For Term Ending June 30, 1915:
T. ELLIS RAMSDELL, Class of 1902, Agent, Monument Mills, Housatonic, Mass.
For Term Ending June 30, 1916:
DEXTER STEVENS, Class of 1904, Superintendent, Esmond Mills, Esmond, R. I.
For Term Ending June 30, 1917:
ARTHUR C. VARNUM, Class of 1906, Assistant Superintendent, Stirling Mills, Lowell, Mass.



GENERAL VIEW OF SCHOOL, MERRIMACK RIVER

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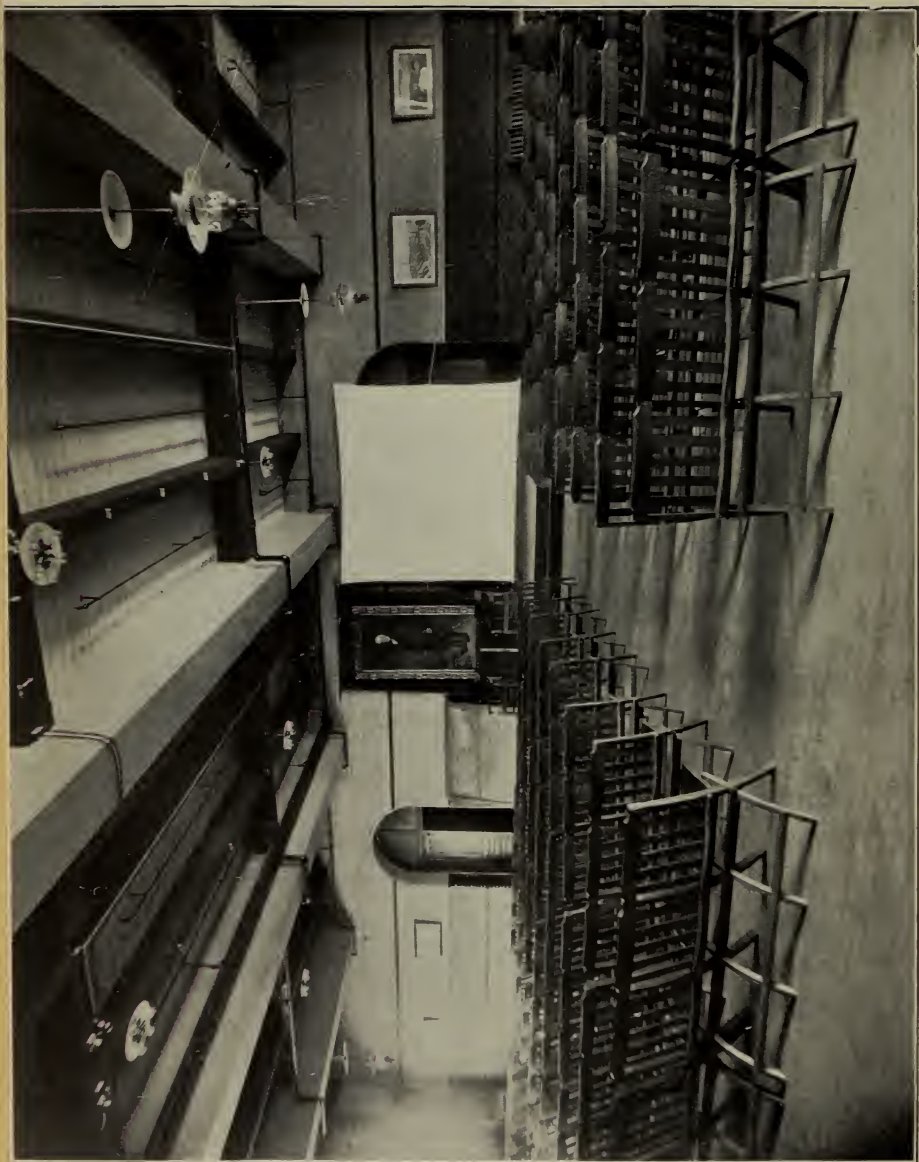
FREDERIC S. CLARK, Chairman ROYAL P. WHITE
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Athletics

JAMES T. SMITH, Chairman
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ASSEMBLY HALL

OFFICERS OF ADMINISTRATION AND INSTRUCTION

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WALTER B. HOLT, Bursar

STELLA F. MORRILL, Registrar

FLORENCE M. LANCEY, Librarian

RENA T. LANDERS, Secretary

CHIEFS OF DEPARTMENTS

LOUIS A. OLNEY, S. B., M. S.,

Professor of Chemistry; in charge of Department of
Chemistry and Dyeing

EDGAR H. BARKER,

In charge of Department of Woolen and Worsted
Yarns

GEORGE H. PERKINS, S. B.,

In charge of Department of Textile Engineering

ARTHUR A. STEWART,

In charge of Department of Finishing

STEPHEN E. SMITH,

In charge of Department of Cotton Yarns and
Knitting

HERMANN H. BACHMANN,

In charge of Department of Textile Design and
Power Weaving

INSTRUCTORS

JOSEPH WILMOT,

Instructor in Power Weaving and Warp Preparation

JOHN N. HOWKER,

Instructor in Wool Sorting and Scouring

STEWART MACKAY,

Instructor in Textile Design and Cloth Analysis

ROBERT R. SLEEPER,

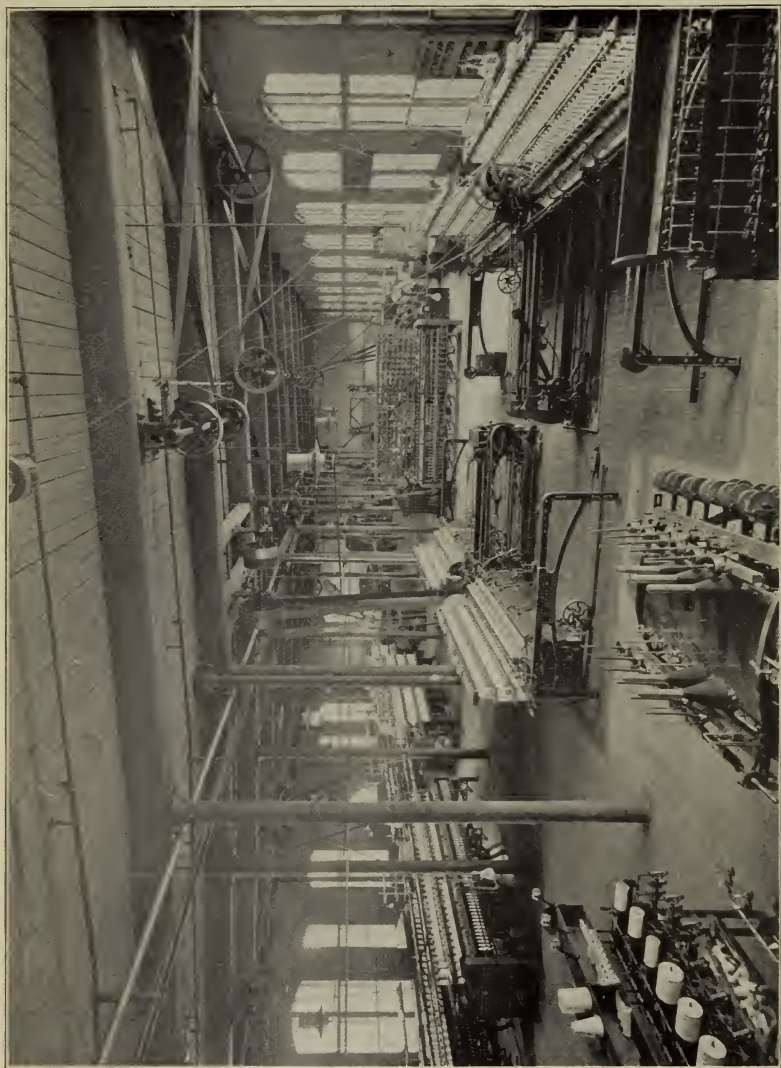
Instructor in Dyeing

HERBERT J. BALL, S. B.,

Instructor in Mechanical and Efficiency Engineering

E. ELIZABETH WHITNEY,

Instructor in Freehand Drawing



COTTON YARN DEPARTMENT

INSTRUCTORS—CONTINUED

- ULYSSES J. LUPIEN, S. B.,
Instructor in Mathematics, Physics and Electrical
Engineering
- HOWARD D. SMITH, PH. D.,
Instructor in Chemistry
- RUSSELL B. STODDARD, A. B.,
Instructor in Chemistry
- ALBERT E. MUSARD,
Instructor in Jacquard Weaving
- JOHN C. LOWE,
Instructor in Woolen and Worsted Yarns
- LESTER H. CUSHING, A. B.,
Instructor in Commercial Languages, English and
History
- CHARLES H. JACK,
Instructor in Machine Shop Practice
- HENRY K. DICK,
Instructor in Knitting and Cotton Yarns
- RALPH E. GUILLOW,
Instructor in Physical Culture
- BERTRAND F. BRANN, S. B., M. S.,
Instructor in Chemistry
- DAVID M. HUNTING, A. B., S. B.,
Assistant Instructor in Mechanical Drawing
- HAROLD W. LEITCH,
Assistant Instructor in Chemistry
- ELLIOTT B. PLUMMER,
Assistant Instructor in Dyeing
- ARCHIBALD R. GARDNER, M. D.,
Medical Adviser

FACULTY

CHARLES H. EAMES

LOUIS A. OLNEY
EDGAR H. BARKER
GEORGE H. PERKINS

STEPHEN E. SMITH
ARTHUR A. STEWART
HERMANN H. BACHMANN



COTTON YARN DEPARTMENT

The Lowell Textile School

The Lowell Textile School was established, and is managed, by the Trustees of the Lowell Textile School of Lowell, Massachusetts, "for the purpose of instruction in the theory and practical art of textile and kindred branches of industry," as set forth in the act of incorporation.

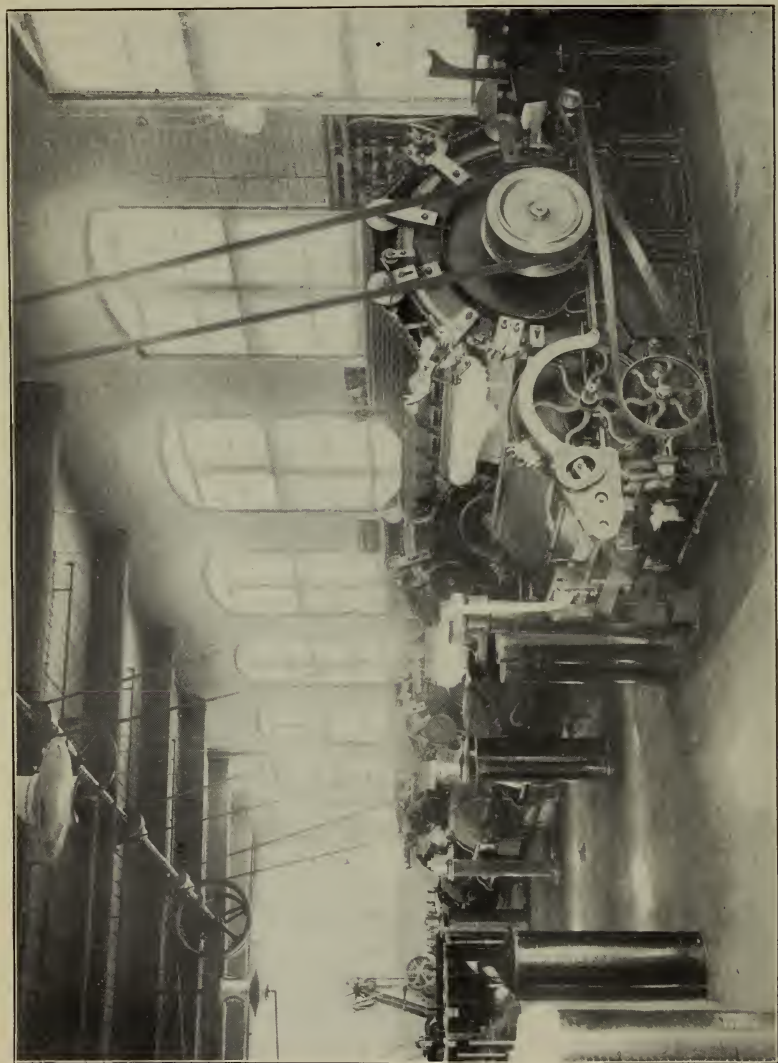
The movement for the establishment of the School dates from June 1, 1891, but it was not opened for instruction until February 1, 1897.

Not only did the normal progress of the textile industry require such a school, but through the rapid development of the manufacture of the coarser cotton fabrics in the southern states, a crisis had arrived in the leading industry of New England which could only be met by wider and more thorough application of the sciences and arts for the production of finer and more varied fabrics.

Modeled on the lines of the departments of the higher Polytechnic Institutes, it offers thorough instruction in the elements and principles of the sciences and arts applicable to textile and kindred branches of industry. Its courses of instruction treat of the application of these principles to the processes and machinery required in the manufacturing of all varieties of textile fabrics.

In industrial education the distinction between Trade and Technical Industrial Schools is coming to be understood. The Lowell School belongs to the latter class. Beginning with limited equipment, instructing staff, and means, instruction at first was by Mill or Trade school methods—the pupil was brought directly to the machine, its parts and operation in manufacturing explained to him. The curriculum was, however, rapidly extended, as contemplated in the original plan, department after department opened and equipped, and commodious and well adapted buildings provided for a permanent home.

While the progress of invention and the demands of ever changing markets will compel constant improvement in methods and additions to the very extensive equipment, the period of



COTTON CARDING

establishment is substantially closed. All departments are open for instruction in all branches of the textile art under extensive and able corps of instructors and assistant instructors.

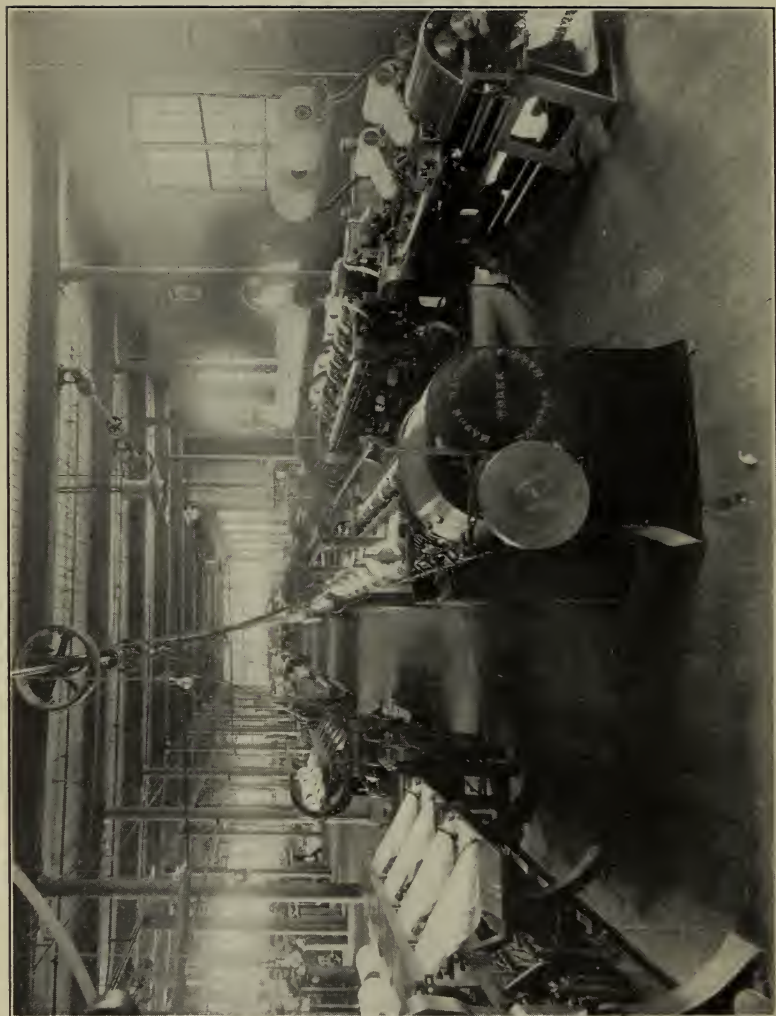
Of the incorporators the permanent trustees (limited to twenty) are mainly representatives, as president, treasurer, agent, or superintendent, of the management of great textile or textile machine corporations of the Commonwealth, and associated with them are, *ex officiis*, His Honor, the Lieutenant Governor and the Commissioner of the State Board of Education, and two trustees appointed for four-year terms by the Governor and Council. The Mayor, the President of the Municipal Council, the Superintendent of Schools, and a representative of the textile council of the city of Lowell are also members. At the session of 1905 the Legislature authorized the graduates of the school to elect two additional trustees, and by an act of 1906 the number was increased to four for four-year terms, one being elected each year.

By the terms of the by-laws at least three-fourths of the permanent trustees must be persons "actually engaged in or connected with textile or kindred manufactures."

Lowell, Massachusetts is called the "Mother Textile City of America," and in locating the school at this center a considerable advantage is secured for the reason that every commercial fibre is utilized in the products of the great Merrimack Valley Textile district. The practical work of the school is therefore kept closely in touch with the several branches of the industry which are included in the courses of study.

His Excellency, Governor Roger Wolcott, formally opened the school on January 30, 1897, there being present a large and representative gathering of men from the textile industries in all portions of New England. The regular classes of the school were opened on February 1, 1897, and have been regularly conducted since that time.

His Excellency, Governor John L. Bates, dedicated the buildings forming the permanent home of the school on February 12, 1903, in the presence of a large number of guests representing the Legislature as well as the educational, textile, and commercial interests of the Commonwealth.



COTTON COMBING

The day classes have been organized for those who can devote their entire time for three or more years to the instruction requisite in preparing to enter the textile industries. It has been found necessary to require of all such students educational qualifications equivalent to those given by a regular four year course of a high school or academy of good standing.

For those who are unable to attend the day courses classes are held for about twenty weeks of the year in the evening. The courses then given are similar to those of the day, but are aimed especially to meet the needs of those working during the day in the mills and shops. For entrance to these classes an applicant should have the equivalent of a grammar school education.

The school has so advanced in the standard and character of its work, as well as the standard for admission to its day classes, that upon application to the Legislature of the State of Massachusetts permission was given to the school to grant the degrees of Bachelor of Textile Engineering (B. T. E.) and Bachelor of Textile Dyeing (B. T. D.) upon the satisfactory completion of prescribed four year courses.

The mechanical equipment of the school includes the best makes of textile machinery, and these machines, while built as they would be for regular work, are, as far as possible, adapted to the experimental work which is of particular value in such an institution as this.

There is a more varied equipment in this school than in any other, either in America or Europe, and it is now possible to convert the raw stock into the finished fabric, within the school.

The growth of the school has been constant, as is evident from the fact that when it was opened February 1, 1897, there were 32 day and 110 evening pupils. January 1, 1914, the roster showed 134 day pupils and 651 evening pupils or 785 in all.

On January 1, 1903, the School was transferred from the rented quarters that it had occupied for five years to the site and building where it is permanently located.

The site is a commanding one, consisting of about fifteen acres at a high elevation, on the west bank of the Merrimack River, extending to and overlooking the rapids of Pawtucket Falls, the first to be utilized for power weaving in America on an extensive scale. This site was contributed by Frederick Fanning



WOOLEN AND WORSTED YARN DEPARTMENT

Ayer, Esquire, of New York City, and the Proprietors of the Locks and Canals on the Merrimack River. The buildings consist of Southwick Hall, Kitson Hall, the Falmouth Street Building and Colonial Avenue Laboratories, with power plant east of the Falmouth Street Building.

Southwick Hall was contributed by the Commonwealth of Massachusetts and Frederick Fanning Ayer, Esquire, of New York City, and is a memorial to Royal Southwick, a leading textile manufacturer, a public man of earlier days, and a maternal ancestor of Mr. Ayer. It includes a central mass 90 x 90 ft., having three stories and two wings 80 x 85 ft. each with two stories and well lighted basements. The building is pierced in the center by an arched way from which access is had to the wings and to the central courtyard. The northern wing is occupied by the General Offices, Engineering and Finishing Departments, and Library, while the southern wing is entirely occupied by the Chemistry and Dyeing Departments. In the basement is located an Industrial Chemistry Laboratory for the manufacture of dyes from the crude material.

Kitson Hall, dedicated to the memory of Richard Kitson, was contributed by Charlotte P. Kitson and Emma K. Stott, his daughters; the Kitson Machine Company of Lowell, founded by Mr. Kitson, was also a generous contributor.

This hall makes a right angle with Southwick Hall, is 60 feet by 252 feet and has one story and a basement. The first floor is occupied by the Cotton Yarn and Knitting Departments, while the basement contains the Mechanical Engineering Laboratory, Machine Shop, and Students' Locker and Recreation Rooms.

The Falmouth Street Building forms the third side of the quadrangle and consists of two portions, one 75 x 130 ft., three stories, and the head house 70 x 80 ft., three stories and basement. This building is occupied by the Design and Power Weaving Department and by the Woolen and Worsted Yarn Department, and contains on the lower floors an equipment for the manufacture from wool in the fleece of finished woolen and English or French spun worsted yarns. The upper floors are occupied by a great variety of plain, dobby and Jacquard looms.

Colonial Avenue Building was erected in the summer of 1910 from plans prepared by the Engineering Department. The work



WOOL SORTING

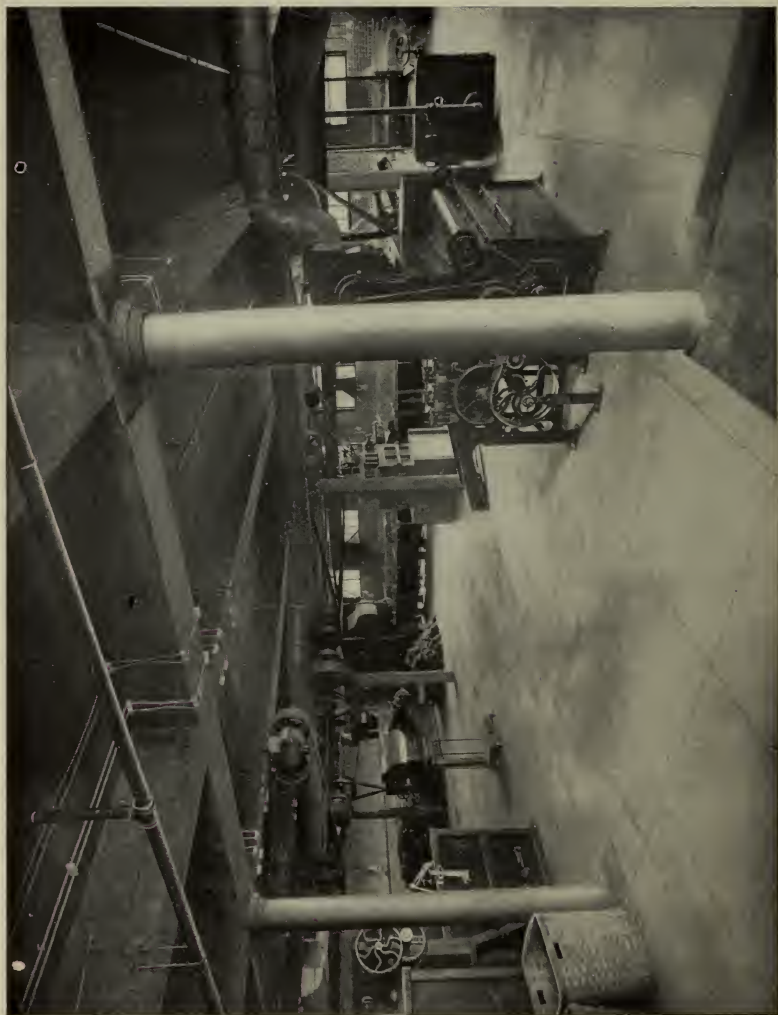
of construction was also in charge of the engineers of this department. The building completes the fourth side of the quadrangle and in outward appearance corresponds to the architectural features of the other school buildings. It is a single story building and has the dimensions of 195 x 60 ft. Its interior is faced with cement brick made at the school during the progress of the work. These serve to give light reflecting walls which are advantageous for the work of the Wool Manufacturing, Cotton Finishing and Chemistry and Dyeing Departments that occupy this building. The funds for this building were provided by the state of Massachusetts.

The buildings are all faced on the exterior with light brick with granite and Indiana limestone trimmings. They are of modern mill construction adapted to educational uses. The floor space of the several departments is as follows:

Cotton Yarns and Knitting	12,000 sq. ft.
Woolen and Worsted Yarns	28,160 " "
Textile Design and Decorative Art	16,806 " "
General Chemistry and Dyeing Laboratories	28,400 " "
Finishing Cotton, Woolen and Worsted	10,606 " "
Power Weaving	15,360 " "
Textile Engineering	24,297 " "
Power Plant	10,047 " "
Assembly and Physical Culture Halls	10,800 " "
Entrances, corridors, stairways, etc.	14,487 " "

The additional floor space is devoted to Administration Offices, Library, Assembly Halls, Class Rooms, Store Rooms, etc.

Though from the first the management has kept in view the clearly defined objective which called for the establishment of the school, namely, the needs of the textile and kindred industries, it has developed its curriculum, its instruction methods, and equipment as those needs arose or became evident. At this writing its chemical and dyeing, decorative art, design, yarn and weaving departments are liberally housed, equipped, and provided with able instructors for the highest efficiency, though additional floor space is required and is being provided as the roster of pupils increases. This objective will be kept constantly in view and as new demands are presented an effort will be made to extend courses, equipment and floor space.



WOOL SCOURING AND CARBONIZING

EQUIPMENT

The equipment of machinery, inventoried January 1, 1914, at \$256,295.67, is most varied for textile educational purposes, and is being constantly augmented. The builders of the various machines installed keep in close touch with the school, adding to the machines such improvements as are made from time to time, and each year some new machine will be added by a manufacturer who finds it to his advantage to be represented here. This operates to mutual advantage of student and manufacturer.

COTTON DEPARTMENT

Ginning

- One 50 saw gin made by Daniel Pratt Gin Co., Prattsville, Ala.
- One Prior Roller Gin.

Opening, Picking and Waste Machinery

An outfit of Kitson Picking Machinery from works of Saco-Lowell Shops, Lowell, Mass., including:

- One No. 7 Opener with Automatic Feeder connected by Perham patent Cleaning Trunk to
- One 40 in. Single Beater Breaker Lapper with Condenser and gauge box feed.
- One 40 in. Single Beater Intermediate Finisher Lapper with Perham & Davis Sectional Plate Evenner, apron to double four laps.
- One 40 in. Single Beater Finisher Lapper with Perham & Davis Sectional Plate Evenner, apron to double four laps, Kirschner Patent Carding Beater.
- One Roving Waste Opener.
- One Thread Extractor.

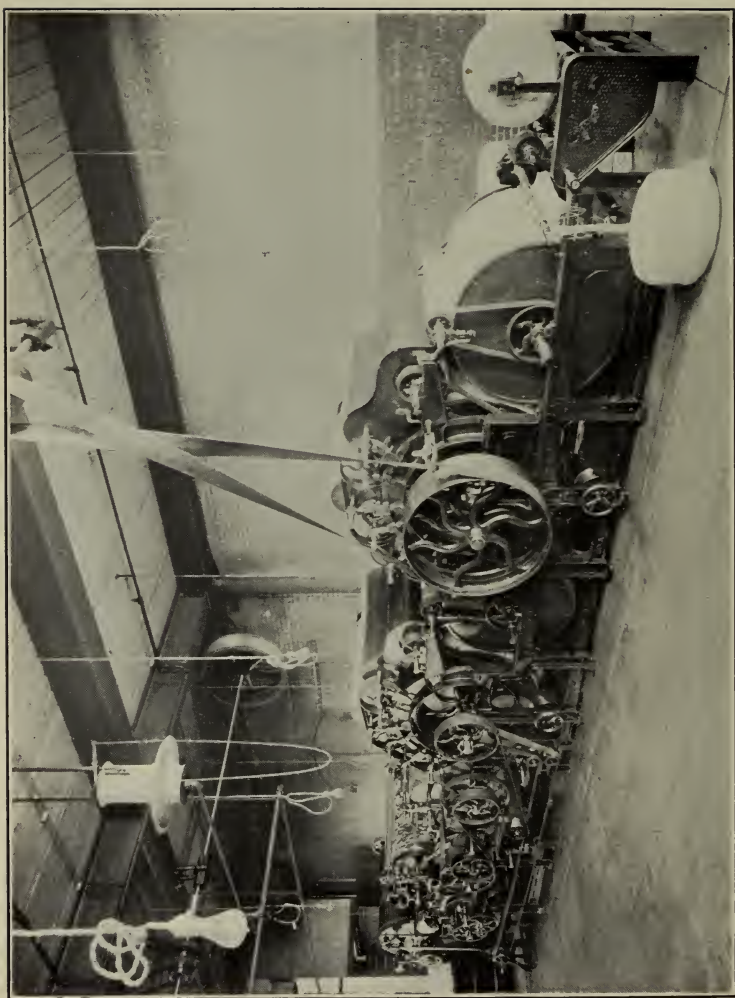
Carding, Combing and Drawing

The following machinery made by the Saco-Lowell Shops, Lowell, Mass.

- One Top Flat Card.
- Three Revolving Flat Cards.
- Two Railway Heads.
- Two Drawing Frames.

One of these cards is equipped with the Chapman Electric Neutralizer, made by the Chapman Electric Neutralizer Co., Portland, Me.

From Saco-Lowell Shops
Stripping Rolls, etc.



WORSTED CARD

From the Whitin Machine Works, Whitinsville, Mass.

- One 40 in. Revolving Flat Card.
- Card Grinding Rolls.
- One Sliver Lapper.
- One Six Head Ribbon Lapper.
- One Four Head Ribbon Lapper.
- One Two Head Comber.
- One Six Head Comber.
- One Eight Head High Speed Comber.

From the Mason Machine Works, Taunton, Mass.

- One Sliver Lap Machine.
- One Comber.

From John Hetherington & Sons, Ltd., Manchester, Eng.

- One Two Head Comber.

Rozing, Spinning and Twisting

From Saco-Lowell Shops, Lowell, Mass.

- One Slubber.
- One Intermediate.
- One Fine Frame.
- One Jack Frame.
- Three Ring Spinning Frames.
- One Spinning Mule.
- One Spooler.
- One Wet and Dry Twister.

From Fales & Jenks, Pawtucket, R. I.

- One Wet and Dry Twister.

From Draper Company, Hopedale, Mass.

- One Wet and Dry Twister.

From Whitin Machine Works, Whitinsville, Mass.

- Two Ring Spinning Frames.

From Woonsocket Machine and Press Co., Woonsocket, R. I.

- One Intermediate Fly Frame.

From Asa Lees Co., Oldham, England, Wm. Firth Company, Agents.

- One Mule for fine spinning.

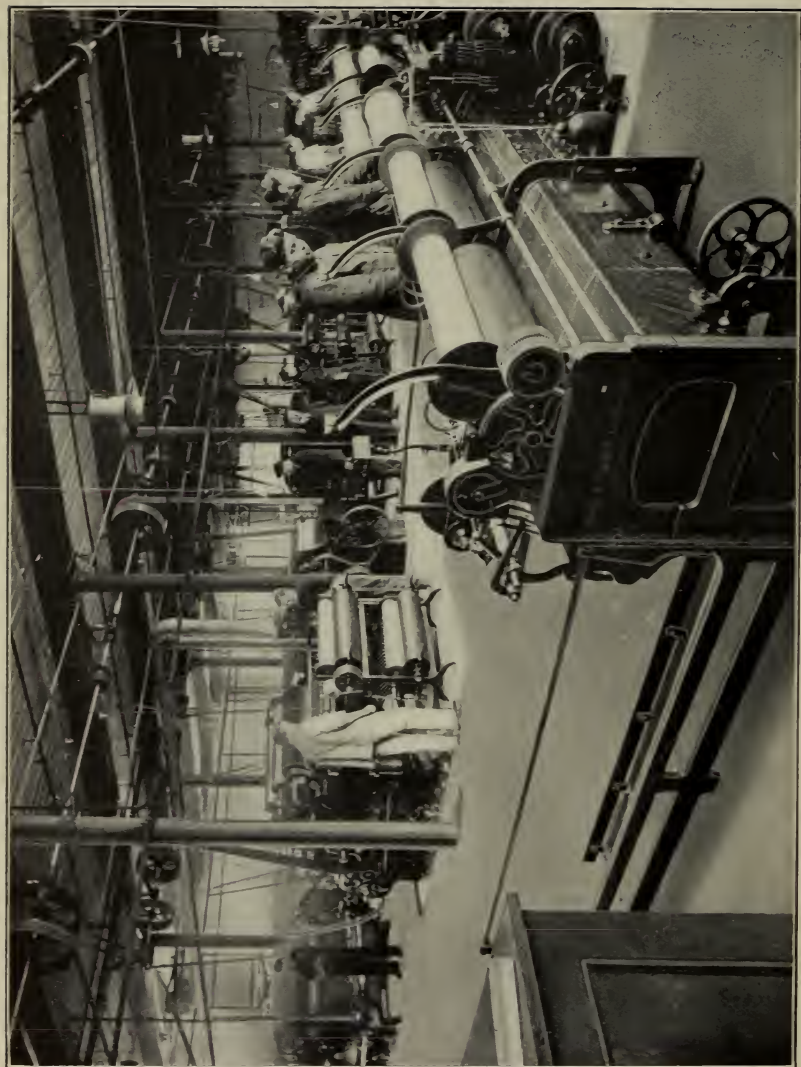
Miscellaneous Machinery of this Department includes:

From the Saco-Lowell Shops, Lowell, Mass.

- One Reel.
- One Model Fine Fly Frame.
- One Model Fly Frame Compound.
- One Model Card Feed.
- One Model Flat Grinding Device.
- One Model Scroll Setting Device.

From The Universal Winding Company, Providence, R. I.

- One Six Head Universal Winder, for cones, tubes or multiple winding.

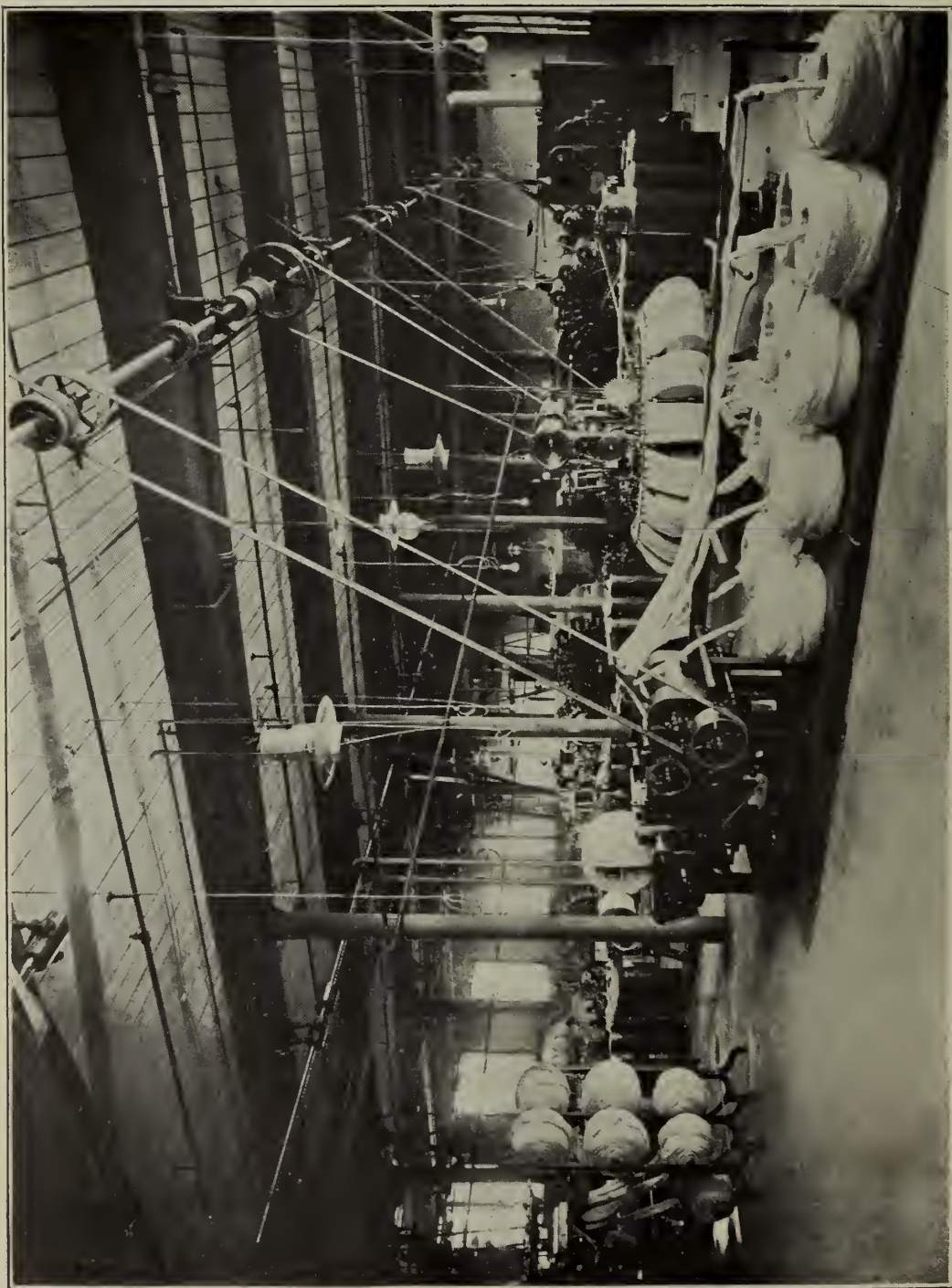


WOOLEN YARN DEPARTMENT

From George W. Payne Co., Pawtucket, R. I.
 One 12 Spindle Cone Winder.
 From Draper Company, Hopedale, Mass.
 One Weeks Banding Machine.
 One Moscrop Single Thread Testing Machine.
 Miscellaneous Machines.
 One Yarn Inspection Machine with blackboards.
 Two Barbour Knotters.
 Two Yarn Reels and Grain Scales.
 One Power Yarn Tester.
 One Twist Counter.
 From Howard Brothers, Worcester, Mass.
 One Exhibition Board of Hand Cards.
 One Exhibition Board of Card Clothing.

Knitting Department

One Mayo "Acme" Full Automatic Seamless Knitting Machine from Mayo Knitting Machine and Needle Co., Franklin Falls, N. H.
 One Mayo "Acme" Full Automatic Knitting Machine with lace front attachment from Mayo Knitting Machine and Needle Company, Franklin, N. H.
 One George D. Mayo Full Automatic Seamless Knitting Machine from George D. Mayo Machine Co., Laconia, N. H.
 One George D. Mayo Full Automatic Knitting Machine with yarn changer and striper from George D. Mayo Machine Co., Laconia, N. H.
 One Brinton Full Automatic Seamless Knitting Machine from H. Brinton Company, Philadelphia, Pa.
 One Brinton 200 Needle Ribber with clearing course attachment from H. Brinton Company, Philadelphia, Pa.
 One Brinton Rib Knitting Machine with Knee and Ankle Splicer and Plater from H. Brinton Co., Philadelphia, Pa.
 One McMichael and Wildman Rib Top Knitting Machine from Wildman Mfg. Company, Norristown, Pa.
 One Wildman Rib Knitting Machine, with Knee and Ankle Splicer and Automatic Stop Motion, Wildman Mfg. Co., Norristown, Pa.
 One Wildman Rib Top Machine with Automatic Stop Motion from Wildman Mfg. Company, Norristown, Pa.
 One Wildman Rib Knitting Machine with stripping automatic tucking attachment and Stop Motion from Wildman Mfg. Co., Norristown, Pa.
 One Branson Stocking Machine from Branson Knitting Machine Co., Philadelphia, Pa.
 One Banner Knitting Machine with splicing and plating attachments from the Hemphill Mfg. Co., Pawtucket, R. I.
 One Scott & Williams New Automatic Half-hose from Scott & Williams, Philadelphia, Pa.



WOOL COMBING

- One Scott & Williams Ribbed Underwear Machine.
- One Crane 19 in. cylinder Flat Web Machine from Crane Mfg. Co. Lakeport, N. H.
- One Grosser, One Section Jacquard Machine from Grosser Knitting Machine Company, N. Y.
- One Grosser two thread Looper for fine work from Grosser Knitting Machine Company, New York.
- One Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Lamb Glove Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One 24 inch Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Beattie Looper from Beattie Machine Works, Cohoes, N. Y.
- One Hepworth Looper with trimming attachment from J. W. Hepworth and Co., Philadelphia, Pa.
- Five Sewing Machines, including two Shell Stitch Machines and three 2- and 3-thread Overseaming and Crocheting Machines, from Merrow Machine Co., Hartford, Conn.
- Five Sewing Machines, including machines for Overseaming, Double Stitch Covering, Seaming and Welting, Vest Finishing, etc., from Union Special Sewing Machine Co., Boston, Mass.
- One Button Holing Machine, one Button Sewing Machine and one Plain Lock Stitch Sewing Machine in the special tables for all machines, from Singer Sewing Machine Co., New York City, N. Y.

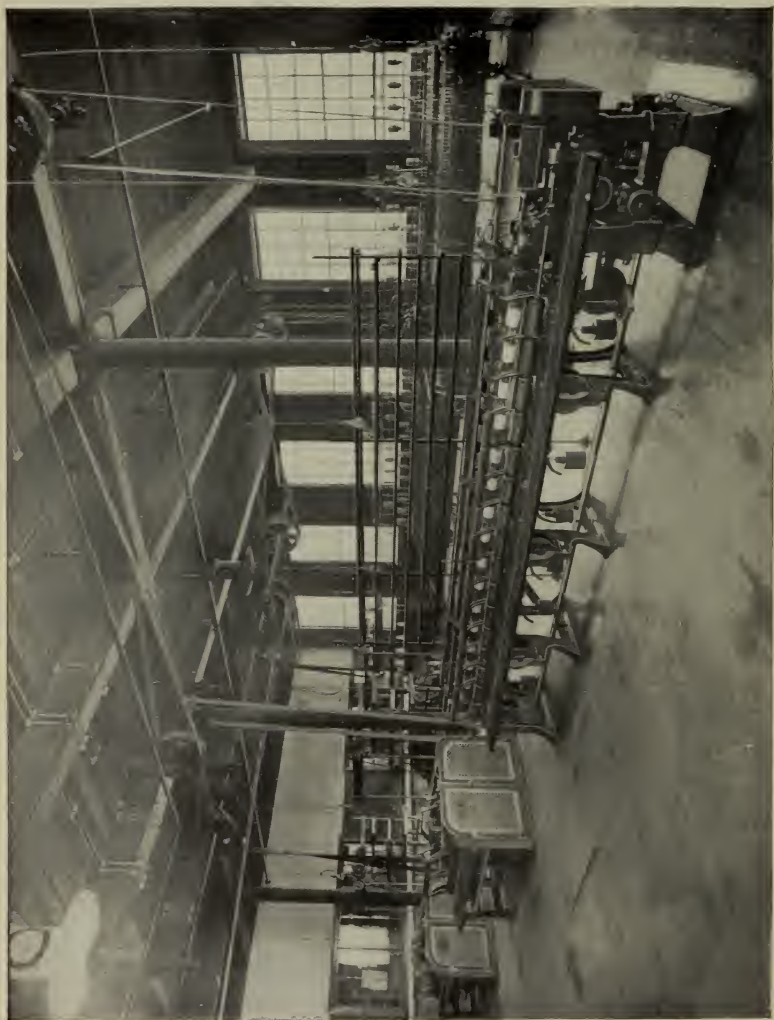
WOOLEN AND WORSTED DEPARTMENT

Wool Sorting and Grading

This department is thoroughly equipped with benches, baskets, etc., for sorting wool in a convenient manner, and in addition there are samples of all grades and types of wool and other fibres.

Scouring and Carbonizing

- Wool Scouring Machinery, C. G. Sargents' Sons Corp., Graniteville, Mass., consisting of
 - Cone Duster for Grease Wool.
 - Two Scouring Bowls, each 17 ft. x 24 in., with Parallel Rakes.
 - One Automatic Feeder for Scouring Bowls.
 - One Automatic Feeder for Dryer.
 - One Single Apron Dryer.
 - Carbonizing Screw Acid Tank.
 - Carbonizing Duster, with Crush Rolls.
- From North Chelmsford Machine Co.
 - One Rinse Box.



FRENCH SPINNING

From Schaum & Uhlinger, Philadelphia, Pa.

One Hydro-Extractor.

From C. S. Dodge, Lowell, Mass.

One Shoddy Picker.

One Bagging Stand.

Woolen

Picking

One Parkhurst Burr Picker, Atlas Mfg. Co., Newark, N. J.

One Mixing Picker, Davis & Furber Machine Co., North Andover, Mass., equipped with Improved Mixing Picker Feed, and Spencer Oiler, both made by George S. Harwood & Son., Boston, Mass.

Carding

One set of Woolen Cards, including:

First Breaker, Second Breaker and Finisher, Davis & Furber Machine Co., North Andover, Mass.; this set of cards equipped with Bramwell First Breaker Feed, (George S. Harwood & Son, Boston, Mass.); Torrance Balling Head and Creel, (Torrance Mfg. Co., Harrison, N. J.) between First Breaker and Second Breaker; Apperly Feed, (George S. Harwood & Son, Boston, Mass.) between Second Breaker and Finisher, and Combination Rub Rolls and Apron Condenser, (Davis & Furber Machine Co., North Andover, Mass.), on Finisher. These cards are for medium or coarse work.

One set of Davis & Furber Woolen Cards, including:

First Breaker, Second Breaker and Finisher. This set of cards equipped with Bramwell First Breaker Feed, (George S. Harwood & Son, Boston, Mass.); Apperly Feed with Kemp Traveller, (George S. Harwood & Son, Boston, Mass.), between First Breaker and Second Breaker; Bates Feed (E. V. Bates, Lowell, Mass.), between second Breaker and Finisher, and Davis & Furber Double Apron Condenser, on Finisher. These cards are for fine work.

Both sets of cards are equipped with Chapman Electric Neutralizer, made by Chapman Electric Neutralizer Co., Portland, Me.

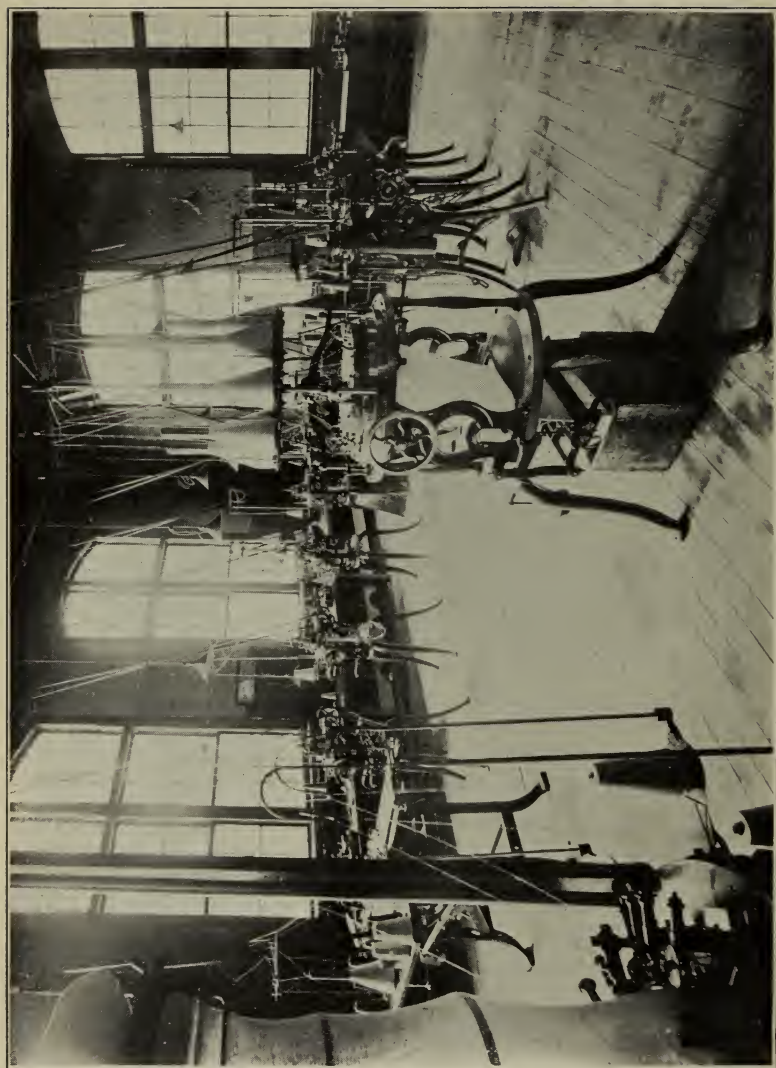
One Sample Mixing Card, Torrance Mfg. Co., Harrison, N. J.

Spinning

One Spinning Mule, 120 spindles, Davis & Furber Machine Co., North Andover, Mass.; Bobbin Holders, supplied by American Bobbin Holder Co., W. Medway, Mass.

One Spinning Mule, 120 spindles, Johnson & Bassett, Worcester, Mass.; Bobbin Holders supplied by Murdock & Geb, Franklin, Mass.

One 1907 Fancy Yarn Twister, 20 spindles, Davis & Furber Machine Co., North Andover, Mass.



KNITTING DEPARTMENT

Card Grinding

- One Roy Grinding Frame, B. S. Roy & Son, Worcester, Mass.
- Two Roy Traverse Grinders, B. S. Roy & Son, Worcester, Mass.
- One Entwistle Traverse Grinder, T. C. Entwistle Co., Lowell, Mass.
- One Complete set of Carder's Tools, W. H. Brown, Worcester, Mass.

Worsted

Carding

- One 50-inch Double-cylinder Worsted Card (4 lickerin), Davis & Furber Machine Co., North Andover, Mass., equipped with Bramwell Feed, George S. Harwood & Son, Boston; also equipped with a Chapman Electric Neutralizer, Chapman Electric Neutralizer Co., Portland, Me.

Backwashing

- One Double Bowl, Five Cylinder Backwasher, with Gill Box, Taylor-Wadworth & Co., Leeds, Eng., equipped with blueing motion, oiling motion, and Layland Patent pressure motion.

Gilling

- One Doubling Balling Head Gill Box (with double screws), Saco-Lowell Shops, Lowell, Mass.
- One Weigh Gill Box and Creel, Saco-Lowell Shops, Lowell, Mass.

Combing

- One Baller, (punch), Crompton & Knowles, Worcester, Mass.
- One Noble Worsted Comb, Crompton & Knowles, Worcester, Mass.

Gilling

- One Finishing Can Gill Box, Hall & Stell, Keighley, England.
- One Finishing Balling Head Gill Box, Hall & Stell, Keighley, England.

Bradford System of Drawing, Spinning and Twisting

The following Drawing, Spinning and Twisting Machinery, from Prince Smith & Son, Keighley, England.

- | | |
|-----------------------------------|-------------------------------------|
| One Revolving Creel for 12 Balls. | One Double Head Can Gill Box. |
| One 2 Spindle Drawing Box. | One 2 Spindle Gill Box. |
| One 2 Spindle Weigh Box. | One 12 Spindle Flyer Spinner. |
| One 4 Spindle First Finisher. | One 12 Spindle Ring Spinner. |
| One 12 Spindle Dandy Reducer. | One 12 Spindle 2 Fold Cap Twister. |
| One 12 Spindle Cap Spinner. | One 12 Spindle 6 Fold Ring Twister. |

The following Drawing, Spinning and Twisting Machinery from the Saco-Lowell Shops, Lowell, Mass.

- | | |
|--------------------------------|--|
| One 2 Spindle Drawing Box. | One 8 Spindle Cone Rover. |
| One 6 Spindle Second Finisher. | One 48 Spindle Cap Spinner, 5 ft. end. |
| One 24 Spindle Dandy Rover. | One 48 Spindle Cap Spinner, 4 ft. end. |
| One 6 Spindle Cone Reducer. | One 48 Spindle Boyd Ring Twister. |



DESIGN LECTURE ROOM

One Six Gang Universal Winder, equipped for cones or straight tubes,
 Universal Winding Co., Boston, Mass.
 One Tape Band Sewing Machine, The Singer Mfg. Co., New York.

French System of Drawing and Spinning

The machinery made by the "Societe Alsacienne de Constructions
 Mechaniques" at Mulhouse, France, consists of the following:

Peigneuse-Laine modèle P. L. B.	Model P. L. B. Comb with creel for 24 doublings.
Intersecting de 2 têtes. Pass. I and II après Peigneuses.	Intersecting Gill Box (2 heads)
Gill Box (2 têtes)	Gill Box (2 heads)
Étirage à Frottoirs (2 têtes)	1st Drawing (2 heads)
tirage à Frottoirs (2 têtes)	2nd Drawing (2 heads)
Étirage à Frottoirs (2 têtes)	3rd Drawing (2 heads)
Étirage Réunion (4 Peignes)	Reducer (4 Porcupines)
Bobinier de Châte (8 Peignes)	Slubber (8 Porcupines)
Bobinier (8 Peignes)	1st Intermediate (8 Porcupines)
Bobinier (8 Peignes)	2nd Intermediate (8 Porcupines)
Bobinier (8 Peignes)	Rover (8 Porcupines)
Finisseur (16 Peignes)	Finisher (16 Porcupines)
Self-acting à Filer (150 Broches)	Self-acting Worsted Mule (150 Spindles)

The apparatus in this department for obtaining and preserving the
 requisite condition of humidity consists of:

Four Humidifiers of the American Moistening Co., Boston, Mass.

Nine Turbo Humidifier Heads from The G. M. Parks Co., Fitch-
 burg, Mass. The compressed air for these heads is supplied by
 an Ingersoll-Rand 8 x 8 steam driven air compressor located in
 power house.

Textile Testing Laboratory

Several years ago the importance of testing fibres, yarns and fabrics
 began to be appreciated and through the generosity of a friend a beginning
 was made by the establishment of a laboratory where the physical prop-
 erties of textiles may be determined and studied. To the original equip-
 ment has been added several pieces of apparatus, so that there is in the
 laboratory or on order the following equipment:—

One Bausch and Lomb D. D. Microscope provided with regular eye
 pieces and objectives for low power, high power or photographic
 work.

One Eye Piece Micrometer.

One Filar Micrometer (1 inch equivalent eye piece) for refined
 diameter determinations.

One Standard Glass Stage with corrections from comparison against
 the International m. m.

Complete outfit for mounting slides and for taking photo-micrographs.



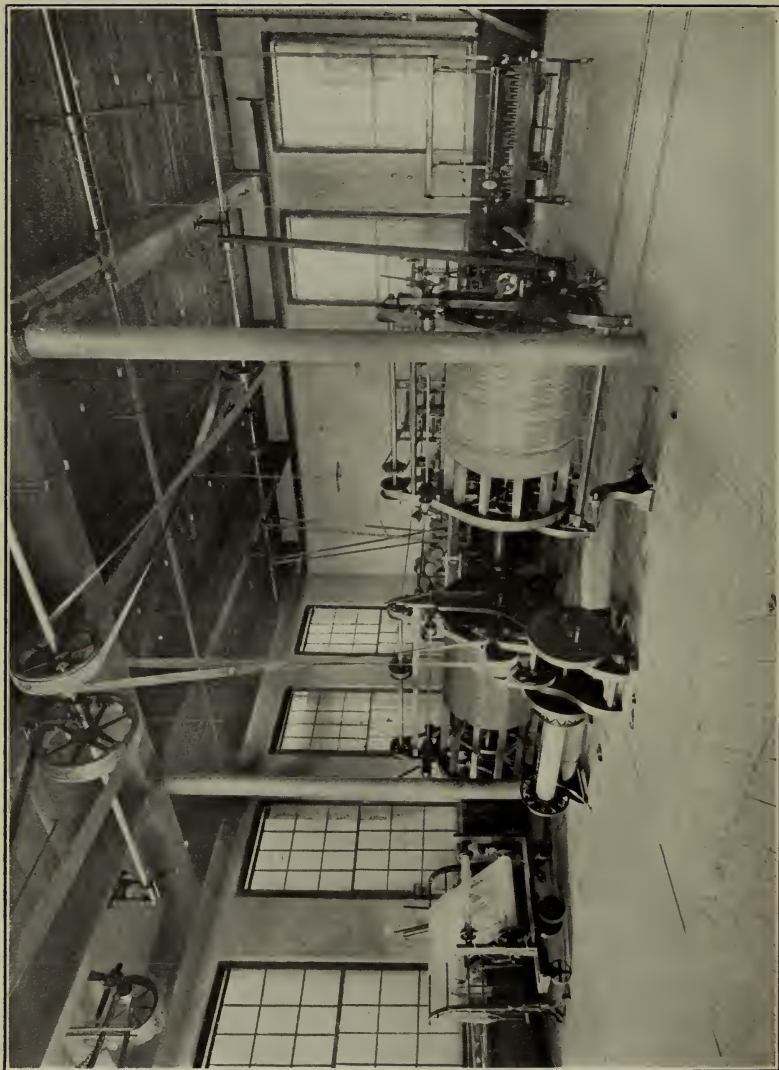
DECORATIVE ART

Camera Lucida.
 Microtome Sectioning Outfit.
 One Small Skein Testing Machine.
 One Gas Conditioning Oven for moisture determination.
 One Single Yarn Testing Machine made by G. R. Smith & Co., Bradford, England.
 One Hydraulic Cloth Strength Testing Machine for 4 inch samples. Made by G. R. Smith & Co., Bradford, England.
 One Hand Cloth Strength Testing Machine for 1 inch samples. Made by Brown Bros., Providence, R. I.
 One Brown & Sharpe Meter Reel.
 One Christian Becker Analytical Balance.
 One Strength Testing Machine. Made by Louis Schopper, Leipzig, Germany. Capacity 500 kilograms for test pieces 50 m. m. in width and from 100 to 400 m. m. in length. Provided with special jaws to test twine, strings, cords or fabrics.
 One Fibre Testing Machine made by Louis Schopper. Capacity 1 gram to 1.5 kilogram. Provided with jaws to test fibres or fine yarns.
 One Yarn Strength Testing Machine made by Louis Schopper. Capacity 1000 grams to 5000 grams. Length of test pieces 200 m. m. to 1000 m. m.
 One Yarn Strength Testing Machine made by Louis Schopper. Capacity 5 kilograms to 30 kilograms. Test pieces 500 m. m.
 One Hygrometer Dr. Koppe's System.
 One Accurate Tread or Pick Counter.
 One Universal Quadrant Scales for determining counts of yarn by the various yarn systems in use.
 These last three pieces of apparatus are also made by Louis Schopper, Leipzig, Germany.

The laboratory has been constructed to give plenty of light. The temperature and humidity of the room is controlled by the Automatic Humidity and Temperature Regulator made by the American Moistening Company of Boston, Mass.

Yarn Weighing and Testing

From Lowell Scale Company:
 One Large Platform Scale.
 From Howe Scale Company.
 One Dram Scale.
 One Gram Scale.
 One Ounce Scale.
 One Pound and Ounce Scale.
 Two Yarn Reels.
 One Roving Reel.
 Three Grain Scales.
 One Run Beam.



WOOLEN AND WORSTED WARP PREPARATION

One Hand Yarn Strength Tester.
Two Twist Counters.
Two Barbour Knotters.
Complete Set of Roving Cans from the Laminar Fibre Co., North Cambridge, Mass.

DESIGN AND POWER WEAVING DEPARTMENT

Cotton Warp Preparation

One Spooler, Saco-Lowell Shops, Lowell, Mass.
One Warper, Saco-Lowell Shops, Lowell, Mass.
One Slasher, Saco-Lowell Shops, Lowell, Mass.
One Beamer, T. C. Entwistle Co., Lowell, Mass.
One Winder, Altemus & Co., Philadelphia, Pa.
One 400 End Improved Draper Warper, Draper Co., Hopedale, Mass.
Drawing-in Frames, etc.
One Pat. Slasher Press Roll, J. Battles & Co., Lawrence, Mass.
One Pat. Expansion Comb for Warper, T. C. Entwistle Co., Lowell, Mass.
One Quiller, Johnson & Bassett, Worcester, Mass.
Set of six in. spools for Warper, Macrodi Fibre Co., Woonsocket, R. I.
One Universal Winder for Cop and Bobbin winding, Universal Winder Co., Boston, Mass.

Woolen and Worsted Warp Preparation

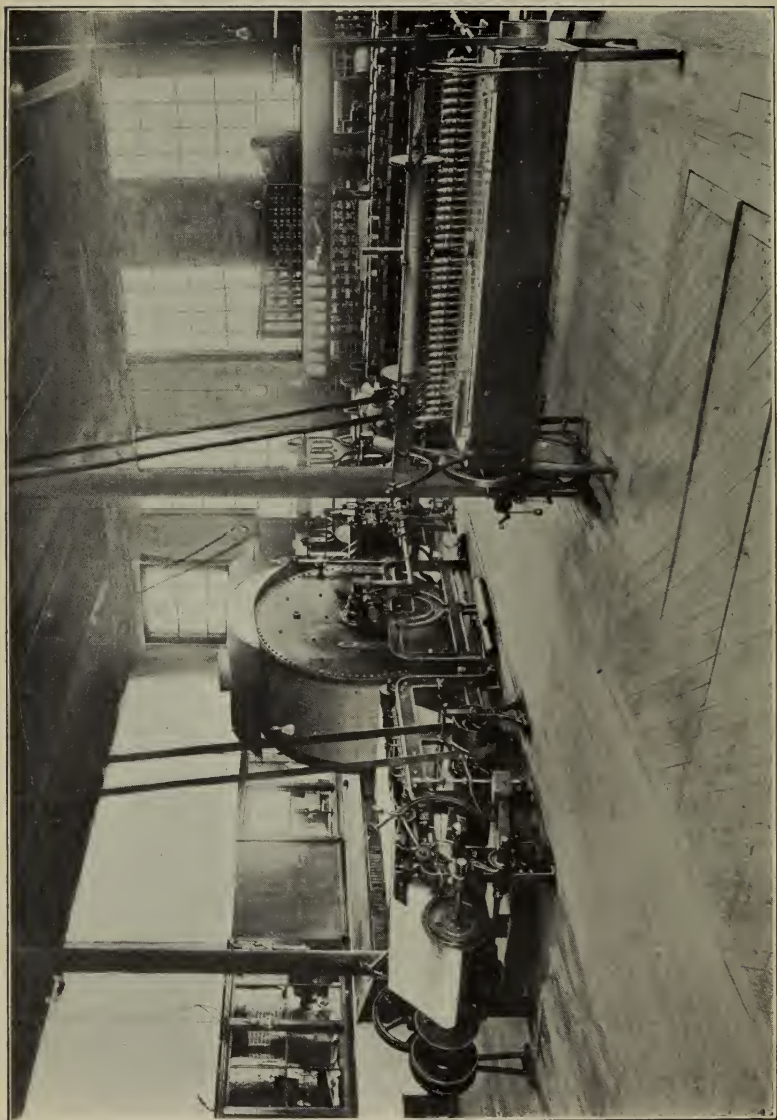
Two 40 End Jack Spoolers.
Two Spool Racks for 12 spools each.
One Pattern Dry Frame Dresser.
One Pipe and Cylinder Dresser.
One 60 inch Reel.
One 82 inch Reel.
One Double Head Beamer.
All made by the Davis & Furber Machine Co., North Andover, Mass.

Braiding Machinery

One 24 Line Hercules Braider.
One 12 Line Braider.
One Tubular Braider.
One Sautach Braider.
All made by the New England Butt Co., Providence, R. I.

Silk Preparing Machinery

One Winder, Atwood Machine Co., Stonington, Conn.
One Ribbon Quiller, Atwood Machine Co., Stonington, Conn.
One Warper and Beamer, Swiss Style, Atwood Machine Co., Stonington, Conn.
One Double Frame, Atwood Machine Co., Stonington, Conn.



COTTON WARP PREPARATION

Plain Looms

- One Plain Northrop Loom, Draper Co., Hopedale, Mass.
- One Plain Print Cloth Loom, Whitin Machine Works, Whitinsville, Mass. To this is attached a Kip-Armstrong Warp Electric Stop Motion.
- One Plain Print Cloth Loom, Mason Machine Works, Taunton, Mass.
- One Kilburn & Lincoln Plain Loom.
- Eight Saco-Lowell Shops Plain Looms.
- One English Loom, Hattersley.
- One Improved Northrop Loom, fine sateen, Draper Company, Hopedale, Mass.
- One Eight Harness Corduroy Loom, Draper Company, Hopedale, Mass.
- One Side Cam Twill Loom, Whitin Machine Works, Whitinsville, Mass.
- One Five Harness Sateen Loom, Saco-Lowell Shops, Lowell, Mass.
- One Harriman Automatic Shuttle Changing Loom.
- One Lewiston Machine Co. Loom, 4 harness, side cam.
- One Crompton Jean Loom.

Fancy Looms

- One Northrop Loom with dobby, Draper Co., Hopedale, Mass.
- One Lewiston Machine Company Bag Loom.
- One Knowles Gingham Loom, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Gingham Loom, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Towel Loom, 2 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Lappet Loom, with 16 harness dobby, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 20 harness dobby, 4 x 1 boxes, for fancy leno work, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 25 harness dobby, Crompton-Knowles Loom Works.
- One Crompton Fancy Cotton Loom, single cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
- One Knowles Gem Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Worsted Loom, 24 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Fancy Loom, 6 x 1 double cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
- One Twenty Harness Dobby Loom, Whitin Machine Works, Whitinsville, Mass.
- One Crompton & Knowles Heavy Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.



WEAVE ROOM

- One Knowles Blanket Loom, 25 harness dobby, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Knowles Worsted Loom, 32 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- Three Knowles Heavy Woolen Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- Three Crompton & Knowles Intermediate Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Model Dobby Attachment.
- One Stafford Ideal Loom, 16 harness, automatic shuttle changing device. Stafford Loom Co., Readville, Mass.

Jacquard Looms

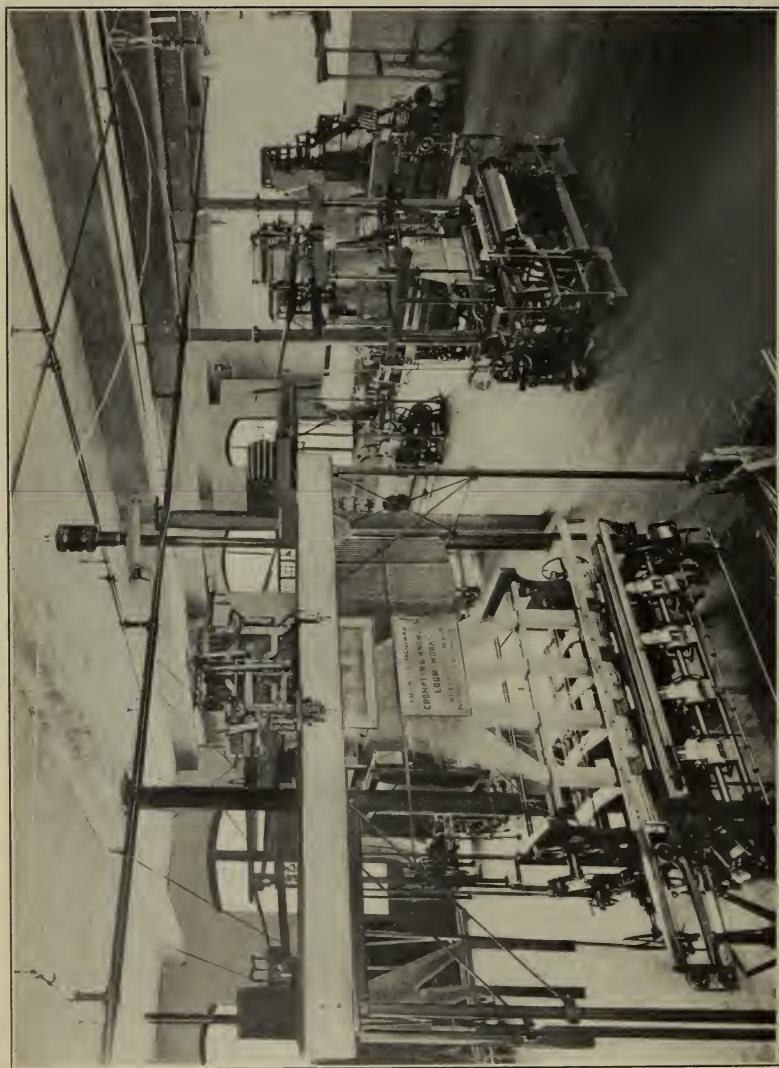
- One Knowles Fancy Loom, single lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, double lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, Jacquard tied up for leno, Crompton-Knowles Loom Works.
- One Knowles Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Knowles Loom, 4 x 4 boxes, 54 inch, with 600 hook double lift double cylinder McMurdo Jacquard Head. Tied up for damask napkin designs.
- One Crompton Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Stafford Silk Loom, 1200 hook Halton Jacquard.
- One Crompton & Knowles 72 in. Tapestry Loom with 2600 hook Halton Jacquard Head.
- One 400 hook single lift, Schaum & Uhlinger Jacquard mounted for 4 bank narrow fabric loom.
- One 840 hook double lift, single cylinder Jacquard on Crompton-Knowles 4 bank ribbon loom.
- One 800 hook, double lift Knowles Gem Silk Brocade Jacquard Machine, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Felix Tonnar German Plush Loom with 400 hook Crompton-Knowles Jacquard Head.

Card Cutting Machines

- One Jacquard Fine Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.
- One Jacquard French Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.

Hand Loom Weaving

- Twelve Hand Looms, 3 x 3 boxes, 20 harness dobby.
- Eight Hand Looms, 4 x 4 boxes, 24 harness dobby.



WEAVE ROOM, JACQUARD SECTION

Eight Hand Looms, 3 x 3 boxes, 32 harness dobby.
Six Hand Looms, 4 x 4 boxes, 30 harness dobby.
Two Hand Looms, 4 x 4 boxes, 32 harness dobby.
Two Hand Looms, 4 x 4 boxes, 200 hook Jacquard.
Two Hand Looms, 3 x 3 boxes, 200 hook Jacquard.
Two Hand Looms, 3 x 3 boxes, 600 hook Jacquard.
One Hand Loom, 48 harness.
Two Hand Looms with treadles.
Pattern Warping Stands.
Beaming, drawing-in stands, etc.

CHEMISTRY AND DYEING DEPARTMENT

Chemical Laboratories

The General Chemistry and Qualitative Analysis Laboratory includes:
One hundred and twenty laboratory desks, each containing a full set of apparatus for the first year's work in Chemistry; also gas and water fittings, reagents and sinks.
Four Large Double Hoods.
Two Steam Baths.
Two Parson's Automatic Gas Generators.

Quantitative Laboratory

One Water Distilling Apparatus.
One Steam Drying Closet and Several Drying Ovens.
One Large Steam Bath.
One Electrolytic Table.
Five Hoods.
Fifty laboratory desks, each fully provided with apparatus.

Balance Room

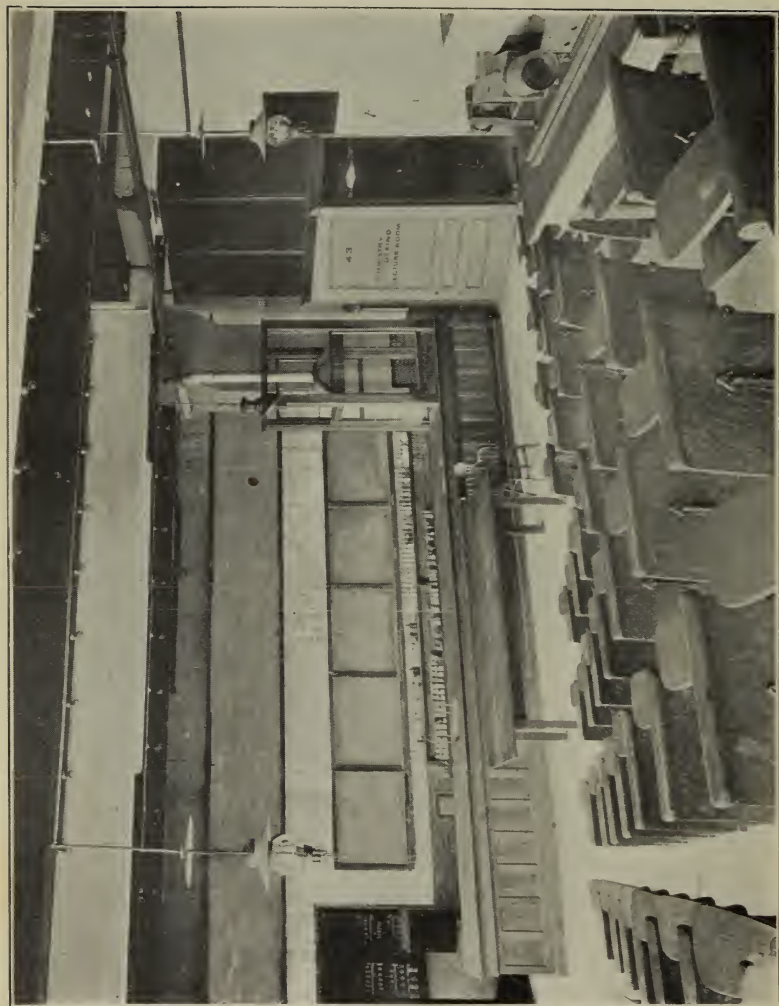
One Large Christian Becker Analytical Balance.
Seven Small Christian Becker Analytical Balances.
One Standing Analytical Balance.
One Eimer & Amend Analytical Balance.
One H. L. Becker's Son & Co. Analytical Balance.

Combustion Room

One Combustion Furnace, 25 burners.
One Lothar Meyer's Furnace for tubes.
One Kerosene Burner Muffle Furnace.

Microscopic and Colorimetric Laboratory

Two Benches for microscopical work.
Three Bausch & Lomb Compound Microscopes.
One Nachet et Fils Compound Microscope.
One Tintometer.



CHEMISTRY LECTURE ROOM

One Ives Colorimeter.
One Polariscopes made by Franz Schmidt & Haensch, Berlin, Germany.
One Spectroscope made by John Browning, London, England.
Desks and shelves for the apparatus and reagents necessary for this branch of the work.
Adjoining this Laboratory is a dark room for Spectrum Analysis, Photometric Work, etc.

Assistant Instructor's Laboratory

One Large Case of Chemicals.
One Double Hood.
One Copper Water Bath.
One Soapstone Sink with a drain board.
Benches, desks and complete fittings for water, gas and suction.

Private Laboratory

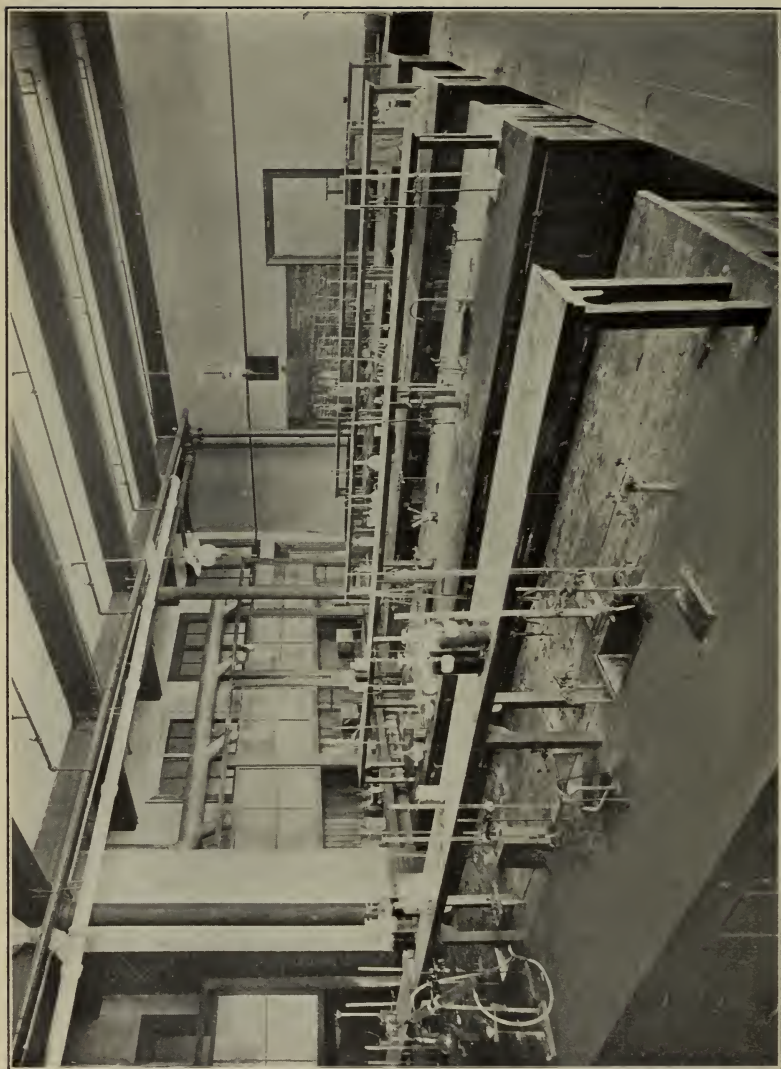
One Groemner Balance.
One Large B. & L. Microscope.
One Case for Chemicals and Apparatus.
Three Laboratory Benches, with necessary fittings.
One Large Hood.
One Steam Bath.
One Experimental Dye Apparatus.
One Porcelain Sink and Drain Board.

Chemical Lecture Room

Is provided with a lecture table fully equipped with gas, water, sinks, a hood and sufficient apparatus for lecture experiments.
An electric arc reflectroscope provided with suitable screen, which makes it possible to illustrate a lecture either from slides or by cuts, photographs or objects.
Seats are provided for eighty students, and are arranged on a raised floor so that every student has a full view of the lecture table.
This room contains various collections of dyestuffs and chemicals for exhibition and for lecture demonstration.

Experimental Dyeing Laboratory

The dyeing laboratory is equipped with individual benches, small dyeing apparatus, reels, balances, apparatus for dye testing, such as frames for exposing dyed material to light, and a complete collection of dyestuff samples and sample cards.
One Small Hydro-Extractor, from W. H. Tolhurst & Son, Troy, N. Y.
Twenty-four Steam Jacketed Experimental Dyeing Machines.
Thirty Steam Coil Experimental Dyeing Machines.
One Drying Chamber.
One Ageing Chamber.



QUANTITATIVE LABORATORY

Experimental Printing Laboratory

- One Calico Printing Machine, made by Mather & Platt, Manchester, England.
- One Iron Jacketed Steaming Chamber from A. Edmeston & Son, Patricroft, England.
- One set of Steam Jacketed Copper Kettles.

Fuel and Oil Analysis Laboratory

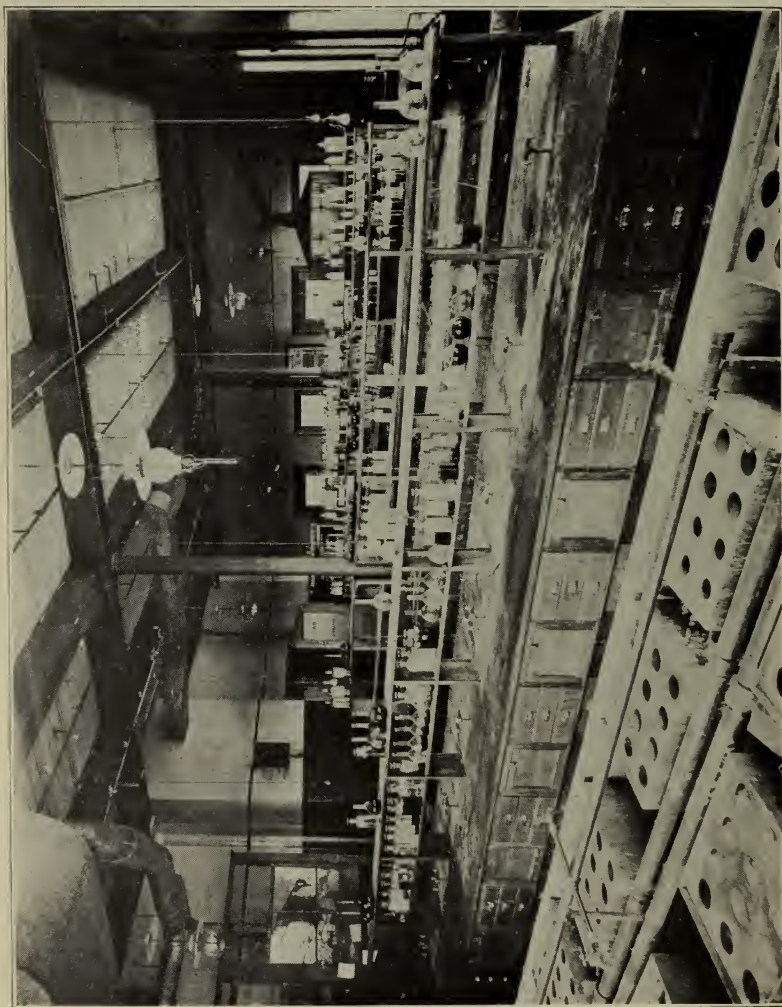
- Mather Bomb Calorimeter, with complete outfit.
- Emerson Bomb Calorimeter, with complete outfit.
- Parr Calorimeter.
- Abbe Refractometer.
- Torsion Viscosimeter.
- Tagliabue Viscosimeter.
- Tagliabue Cold Test Apparatus.
- Pensky Martin Oil Tester.
- N. Y. State Oil Tester.
- Sartorius Specific Gravity Balance.
- Two Becker Analytical Balances.
- Gas Muffle Furnace.
- Kny Scherer Oil Tester.
- Graefe Gas Calorimeter.
- Orsat Gas Analysis Apparatus.
- Laboratory Tables, Lockers and Hoods.

Industrial Chemistry Laboratory

- One Filter Press, Type E, T. Shriver and Co.
- One Single Acting Triplex Plunger Pump, Gould's Mfg. Co.
- One Vacuum Drying Apparatus, Norman Hubbard's Sons.
- One Surface Condenser, Norman Hubbard's Sons.
- One Packard Vacuum Pump, Norman Hubbard's Sons.
- One Vacuum Evaporator, Swenson System, American Foundry and Machine Co.
- One Centrifugal, C. H. Chavant and Co.
- One Double Jar Mill, F. I. Stokes and Co.
- One Sturtevant Ore Crusher.
- One Sturtevant Pulverizer.
- Ten Copper Steam Baths, D. H. Wilson and Co.
- One 36 in. Ventilating Fan, Mass. Fan Co.
- One Autoclave.
- Lockers and Tables.

Commercial Dyeing Laboratory

- One Kier, Atlantic Works, East Boston, Mass.
- One small Kier, fitted with E. D. Jefferson's circulating device.
- One Electrolyzer for manufacturing bleaching solutions, The National Laundry Machine Co., Dayton, Ohio.



EXPERIMENTAL DYEING LABORATORY

One Mercerizing Machine.
 One Raw Stock Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
 One Yarn Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
 One Jig Dyeing Machine, The Textile-Finishing Machinery Co., Providence, R. I.
 One set of Drying Cans, The Textile-Finishing Machinery Co., Providence, R. I.
 One Chain Dyeing Machine, T. C. Entwistle Co., Lowell, Mass.
 One Raw Stock Drying Table, Philadelphia Textile Machinery Co., Philadelphia, Pa.
 One Padding Machine, Arlington Machine Works, Arlington, Mass.
 One Hydro-Extractor, W. H. Tolhurst & Son, Troy, N. Y.
 One Experimental Dyeing Machine, The Psarski Dyeing Machine Company, Cleveland, Ohio.
 One Experimental Dyeing Machine, Hussong Dyeing Machine Co., Croweville, N. J.
 One Sample Piece Dyeing Machine, Rodney Hunt Co., Orange, Mass.
 Seven Dye Tubs.
 One Power Yarn Reel.
 One Reeves' Variable Speed Device.
 Two Trucks.

FINISHING DEPARTMENT

Woolen and Worsted

One 2 string Washer, Rodney Hunt Co., Orange, Mass.
 One Fulling Mill, Rodney Hunt Co., Orange, Mass.
 One Sample Fulling Mill, James Hunter & Co., North Adams, Mass.
 One Up and Down Dry Gig, Curtis & Marble, Worcester, Mass.
 One Rolling and Stretching Machine, Curtis & Marble, Worcester, Mass.
 One Up and Down Wet Gig, Curtis & Marble, Worcester, Mass.
 One Steam Finishing Machine, Curtis & Marble, Worcester, Mass.
 One 60 in. 3 burner Singeing Machine, adapted for Cotton, Silk or Worsted Goods, Curtis & Marble, Worcester, Mass.
 One Two Cylinder Double Acting Brushing Machine, Curtis & Marble, Worcester, Mass.
 One 60 in. 4 Cylinder Sanding and Polishing Machine, Curtis & Marble, Worcester, Mass.
 One Kicker Mill, James Hunter & Co., North Adams, Mass.
 One 6-4 Double Shear, Parks & Woolson, Springfield, Vt.
 One Single Shear, Curtis & Marble. Donated by Mass. Mohair Plush Co., Lowell, Mass.
 One Dewing Machine, G. W. Voelker & Co., Woonsocket, R. I.

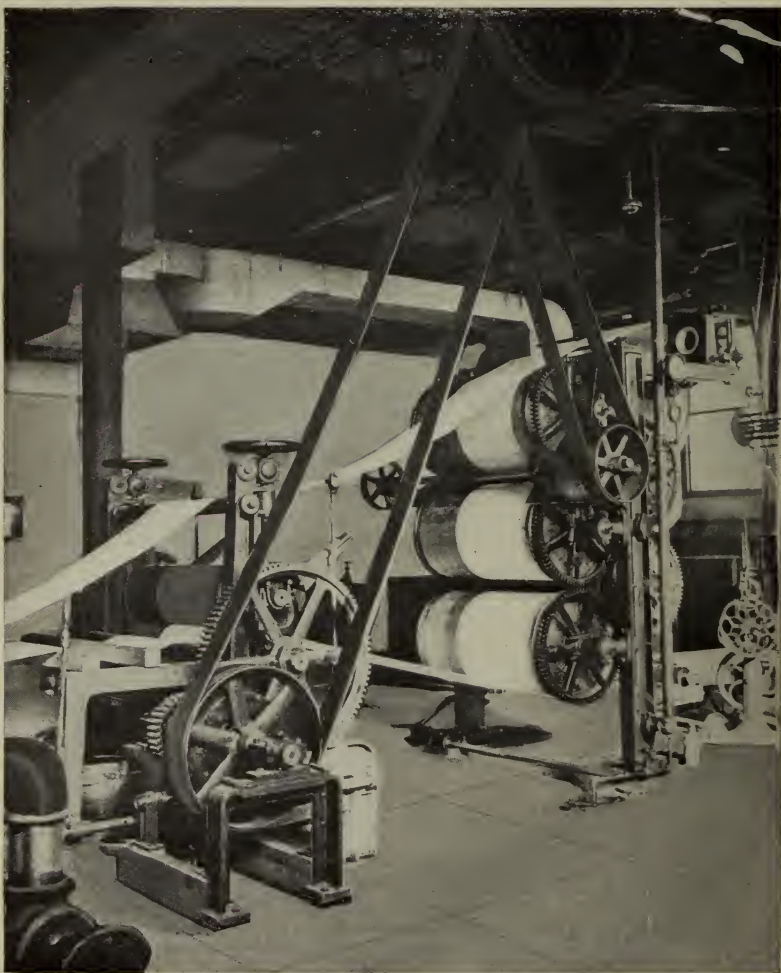


INDUSTRIAL CHEMISTRY LABORATORY.

- One 6-4 Voelker Rotary Press, G. W. Voelker & Co., Woonsocket, R. I.
- One Tentering and Drying Machine, John Heathcote, Providence, R. I.
- One Single Crabbing Machine, H. W. Butterworth & Son, Philadelphia, Pa.
- One 72 in. Woolen Napper, Davis & Furber, North Andover, Mass.
- One 32 in. Basket Hydro-Extractor, W. H. Tolhurst, Troy, N. Y.
- One A. W. C. Measuring and Weighing Machine, Parks & Woolson, Springfield, Vt.
- One Lintz & Eckhardt Cloth Numbering Machine, Improved by Durbrow & Hearne Mfg. Co., New York.
- One Steam Press for Underwear, United States Hoffman Co., Syracuse, N. Y.
- One Sewing Machine, Birch Brothers, Somerville, Mass.
- Soap tanks, perch, burling and measuring tables.

Cotton Finishing Machinery

- One 40 in. Inspecting and Brushing Machine, Curtis & Marble, Worcester, Mass.
- One 44 in. No. 25 Railway Sewing and Rolling Machine, Curtis & Marble, Worcester, Mass.
- One 44 in. Cotton Shearing Machine, Type No. 34, Curtis & Marble, Worcester, Mass.
- One 44 in. No. 3 Steam Calender Rolling Machine, Curtis & Marble, Worcester, Mass.
- One 40 in. Cloth Folder, Curtis & Marble, Worcester, Mass.
- One 40 in. Winder and Measurer, Curtis & Marble, Worcester, Mass.
- One set 44 in. Shear Blades for grinding purposes, Curtis & Marble, Worcester, Mass.
- One 48 in. No. 4 Opening, Sewing and Re-rolling Machine, Dinsmore Manufacturing Co., Salem, Mass.
- No. 1 Hand Power
- One Portable Railway Sewing Machine, Dinsmore Manufacturing Co., Salem, Mass.
- One 40 in. 3 Roll Water Mangle, with husk and brass rolls and usual attachments, The Textile-Finishing Machinery Co., Providence, R. I.
- One 48 in. Mycock Scutcher, for the Water Mangle, Thos. Leyland & Co., 60 India St., Boston, Mass.
- One 40 in. Mycock Cloth Expander, for the Water Mangle, Thos. Leyland & Co., 60 India St., Boston, Mass.
- One 40 in. 2 Roll Starch Mangle, The Textile-Finishing Machinery Co., Providence, R. I.
- One 40 in. Upright Drying Machine with 10 copper cylinders, The Textile-Finishing Machinery Co., Providence, R. I.



VIEW IN COMMERCIAL DYEING LABORATORY

- One 16 x 42 in. Bronze Covered Stretcher, for the Dyeing Cans, C. A. Luther & Co., Providence, R. I.
- One 40 in. double Bristle Stretcher, for Dyeing Cans, American Finishing Machinery Co., 141 Milk St., Boston, Mass.
- One 40 in. Sprinkler, The Textile-Finishing Machinery Co., Providence, R. I.
- One 40 in. 5 Roll Universal Calender, with chasing attachment, The Textile-Finishing Machinery Co., Providence, R. I.
- One 40 in. Mycock Cloth Expander, for the calender, Thos. Leyland & Co., 60 India St., Boston, Mass.
- One 40 in. Tommy Dodd Starch Mangle, H. W. Butterworth & Sons Co., Philadelphia, Pa.
- One Direct Driven 44 in. - 50 ft. - 0 in. Vibratory Tentering Machine, H. W. Butterworth & Sons Co., Philadelphia, Pa.

ENGINEERING DEPARTMENT

STEAM ENGINEERING LABORATORY

The engineering laboratory contains the following equipment:

- 50 H. P. Allis-Chalmers Corliss Steam Engine (Reliance type) for experimental purposes arranged to operate condensing or non-condensing and direct connected to an Alden absorption dynamometer.
- Wheeler Surface Condenser (200 sq. ft. surface) with 5 in. x 6 in. x 6 in. x 7 in. combined air and circulating pump.
- 25 K. W. Kerr Steam Turbine (7 stage) direct connected to 25 K. W. Richmond Electric Co. alternating current generator and arranged for both condensing and non-condensing conditions. The piping is also arranged that this turbine may be run as a low pressure turbine in conjunction with the Allis Chalmers engine. The generator is especially designed for experimental work with connections and windings for all the commercial phases.
- 5000 gallon Pressure Tank for heads up to 300 ft. and connections for experimental work.
- Two 2500 gallon Concrete Storage Tanks.
- Complete set of Weighing and Suction Tanks on Fairbanks Standard scales.
- Deane Triplex Power Pump 4 in. x 6 in.
- Clayton Air Compressor (belted type) 6 in. x 6 in.
- Centrifugal Pump, 2 inch (belted type), Lawrence Machine Company, Lawrence, Mass.
- Two Sturtevant Fan Blowers for experimental work.
- Metropolitan Injector. 3-4 inch.
- Differential Transmission Dynamometer.
- Variable Speed Transmission.



FUEL AND OIL LABORATORY

One dead weight tester for calibrating pressure gages.
 One vacuum pump and mercury column for calibrating vacuum gages.
 Two Steam Engine Indicators (inside and outside spring pattern)
 with reducing wheels and motions. Planimeters (plain and averaging types).
 One Gas Indicator. Speed Counters and Tachometers. Apparatus
 for investigating the rate of heat transmission for steam heating
 coils and condenser tubes. Apparatus for gas analysis is also
 available and the chemical department is fully equipped for cal-
 orific determinations of fuels.
 All steam supplied to the laboratory passes through a 4 inch horizontal
 Cochrane steam separator to insure dry steam for experimental
 work.
 Buff & Buff Engineers Transit.
 Philadelphia Level Rod.
 Apparatus for testing friction and slip of belts and pulleys.

ELECTRICAL ENGINEERING LABORATORY

Standard Marine Finished Slate Switchboard made up of:

One Westinghouse A. C. Generator Panel 25 K. W.
 One Westinghouse A. C. Generator Panel 15 K. W.
 One Circuit Panel for lights and motors.
 One 15 K. V. A. 220 Volt 3-Phase 60 Cycle Synchronous Motor.
 One 10 H. P. 220 Volt D. C. Allis-Chalmers Co. Motor.
 One 10 H. P. 220 Volt D. C. General Electric Co. compound wound
 motor.
 One 7.5 H. P. 220 Volt 3-Phase 60 Cycle General Electric Induction
 Motor.
 One 3 H. P. 220 Volt 3-Phase 60 Cycle General Electric Induction
 Motor.
 One 4 H. P. General Electric Dynamometer which may be used either
 as a rotary transformer or a double current generator. Receives
 or delivers through transformer 220 Volt 60 cycle 3-phase on one
 side and delivers or receives 220 Volt direct current.
 One 5 K. W. 220 Volt 440 Volt Transformer.
 Westinghouse Portable Polyphase Wattmeter with current trans-
 formers.
 Three General Electric A. C. Wattmeters.
 Two General Electric A. C. Ammeters.
 One General Electric A. C. Voltmeter.
 Two 250 Volt D. C. Weston Portable Voltmeters.
 One Weston D. C. Portable Millivoltmeter. 2 ampere and 20 ampere
 shunts for use with the above instrument.
 One 150 amp. D. C. Weston Portable Ammeter.
 Two Weston Model 45 D. C. Ammeters.



MACHINE SHOP

One Weston Laboratory Standard Voltmeter with multiplier to 600 volts.
 One Small Wheatstone Bridge with D'Arsonval Wall Galvanometer.
 One Simple Galvanometer.
 One Leeds & Northrup Potentiometer No. 7551.
 One Wall Galvanometer L. & N. No. 2210 D'Arsonval type.
 One Wheatstone Bridge L. & N. No. 4725 A. with D'Arsonval Galvanometer L. & N. tripod type.
 One Slide Wire Bridge, Leeds and Northrup.
 One Portable Galvanometer No. 2323, Leeds & Northrup.
 One Ohmmeter, Leeds & Northrup.
 One Electro-Dynamometer, Leeds & Northrup.
 One Weston Standard Cell.
 Two Tachometers.
 One Potential Phase Shifter made by States Co., Hartford, Conn.
 One Standard Leeds & Northrup Photometer with Lummer-Brodhun Screen Compound Rotator and Rotating Sector, Screens, etc.
 One Esterline Portable Curve Drawing Wattmeter designed for Polyphase A. C. or Direct Current power measurements. Mechanism to vary speed of paper.
 Two Hand Feed Arc Lamps for stereopticons.
 Resistance boxes of various sizes and other apparatus necessary for commercial testing of lamps, motors, etc.
 Two cell storage battery for constant voltage current supply.
 An Exhibition Board containing samples of the Chloride and Exide Storage Battery Plates donated by the Electric Storage Battery Co. of Philadelphia.
 Miscellaneous apparatus for experiments in Mechanics, Heat, Light, Sound and Electricity.

Machine Shop

The equipment of the machine shop is as follows:

Four Standard Engine Lathes, 13 inch swing, 6 ft. bed, from Flather & Co., Nashua, N. H.
 Three Standard Engine Lathes, 14 inch swing, 6 ft. bed, from Flather & Co., Nashua, N. H.
 One Standard Engine Lathe, 15 inch swing, 6 ft. bed, from F. E. Reed Co., Worcester, Mass.
 One Engine Lathe, 18 inch swing, 10 ft. bed, from Flather & Co., Nashua, N. H.
 One Engine Lathe, 18 inch swing, 6 ft. bed, from Champion Tool Works, Cincinnati, Ohio.
 One Standard Engine Lathe, 15 inch swing, 6 ft. bed, from S. H. Putnam Sons, Fitchburg, Mass.



MECHANICAL DRAWING ROOM

Five Speed Lathes, 17 inch swing, 5 ft. bed, from J. G. Blount, Everett, Mass.

One No. 1 Universal Milling Machine, with all three feeds automatic, from Kempsmith Mfg. Co., Milwaukee, Wis.

One 24 in. x 24 in. 6 ft. Planer, from the Mark Flather Planer Co., Nashua, N. H.

One 23 inch Upright Drill with back gears and power feed, from J. E. Snyder & Son, Worcester, Mass.

One 14 inch Single Sensitive Drill from the Stanley Mfg. Co., Lawrence, Mass.

One No. 1 Universal Grinder from Landis Tool Co., Waynesboro, Penn.

One 20 inch Wet Tool Grinder from J. G. Blount, Everett, Mass.

One 12 inch, Two Wheel, Dry Grinder from J. G. Blount, Everett, Mass.

One American Twist Drill Grinder from the Heald Machine Co., Worcester, Mass.

One Type 1 B Portable Electric Grinder from the Cincinnati Elec. Tool Co., Cincinnati, Ohio.

One 30 inch Grindstone and Frame from the Athol Machine Co., Athol, Mass.

One Single Spindle Centering Machine from D. E. Whiton Machine Co., New London, Conn.

One 15 inch Shaper from Potter & Johnson, Pawtucket, R. I.

One Power Hack Saw from the Fairbanks Co., Boston, Mass.

One Cold Saw from John T. Burr & Son, Brooklyn, N. Y.

Two Blacksmith Forges, Anvils and Tools are also provided.

One Gas Oven for hardening and tempering tools.

These tools are fully equipped with chucks, centres, tools, etc., for a great variety of work. Benches with vises are also provided for such work as chipping, filing, etc.

A thoroughly equipped tool room contains an ample stock of the best makes of small tools such as drills, taps and dies, milling cutters, reamers, gauges, micrometers, etc.

The following wood working tools are also provided in addition to benches for pattern making:—

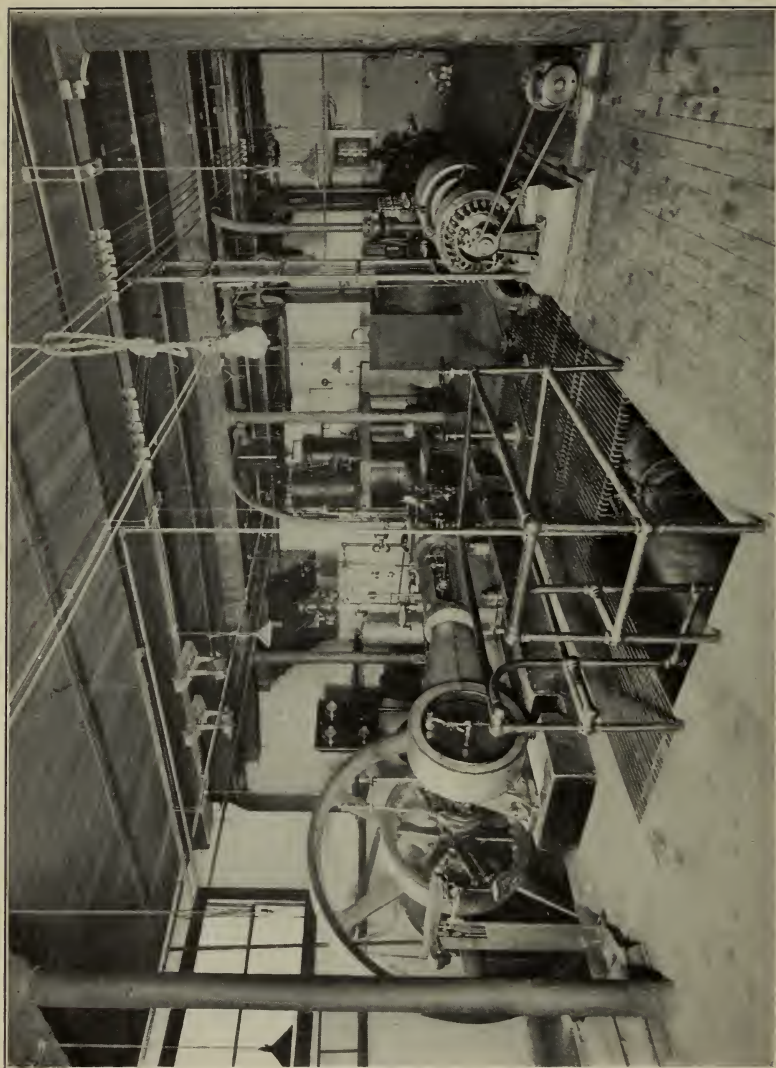
One Pattern Maker's Lathe, 16 in. swing, 8 ft. bed, from Fay & Scott, Dexter, Me.

One 32 in. Band Saw from the Crescent Machine Co., Leetonia, Ohio.

One Iron Single Saw Bench, from the Crescent Machine Co., Leetonia, Ohio.

One Double Saw Bench.

One 12 in. Buzz Planer from W. W. Carey, Lowell, Mass.



ENGINEERING LABORATORY

POWER, LIGHT, HEAT AND VENTILATING PLANT

In the new Power House completed in 1913, there is located the main power generating apparatus for supplying light, heat and power to all departments of the school. The equipment here consists of:

One 300 H. P. Aultman and Taylor Horizontal Water Tube Boiler equipped in U. S. Rocking Grates.

One Knowles Boiler Feed Pump 6 x 4 x 6.

One Deane Boiler Feed Pump 6 x 4 x 6.

All feed water is heated and measured by 30000 lbs. Cochrane Metering Open Feed Water Heater which is provided with a Lea Recorder and a Cochrane Oil Extractor. Harrison Safety Boiler Works, Philadelphia, Pa.

In the Engine Room are located:

One Payne 14 x 14 Automatic High Speed Engine 125 H. P. Direct connected to 75 K. W. 220 Volt D. C. Bullock Generator.

One $9\frac{1}{2} \times 11\frac{3}{4}$ Nash Gas Engine of 50 H. P. four cycle type, with speed regulating clutch and a "hit and miss" governor. Direct connected to a 30 K. W. 220 V D. C. Bullock Generator.

One Steam Driven Ingersoll-Rand 8 x 8 Air Compressor, for use with Tarbo Heads, installed in the French Spinning Department by the G. M. Parks Co., Fitchburg, Mass.

One $5\frac{1}{2} \times 6$ Motor Driven Air Compressor with 20 cu. ft. storage tank for use in starting Nash Gas Engine.

One Cross Oil Filter.

The station switchboard is of Marine Finished Slate 90 inches in height and consists of two generator panels and one circuit panel from which circuits supplying approximately 1200 - 16 candle power equivalent lamps and the following motors:

One 25 H. P. Westinghouse Motor.

One 5 H. P. General Electric Variable Speed Motor.

Three 24 H. P. Bullock Motors.

One 20 H. P. General Electric Motor.

Two 10 H. P. Allis-Chalmers Motors.

Two $7\frac{1}{2}$ H. P. General Electric Motors.

Four 15 H. P. Bullock Motors.

One 3 H. P. New England Motor.

One 2 H. P. Holtzer-Cabot Motor.

The power house is connected with the main school buildings by a tunnel through which all wires, steam and water pipes are carried. The steam pipes supply heat to the building by means of direct radiation and by means of the Sturtevant Double Duct Heating and Ventilating System located in the basement of Southwick Hall and by the Sturtevant Fan and Heater located in the basement of Kitson Hall. Direct driven exhaust fans are placed on the roof of Southwick Hall and in the basement laboratories.



ATHLETIC FIELD AND SCHOOL BUILDINGS

The Humidity of the Spinning and Weaving Departments is provided by the American Moistening Company's system, including 2 heads, a Knowles Triplex 4 x 4 power pump and tank.

In the original boiler house location there is retained, as an emergency unit, 2 - 100 H. P. Stirling Water Tube Boilers and a Sturtevant Induced Draft Apparatus, also Warren Webster Feed Water Heater.

ATHLETICS

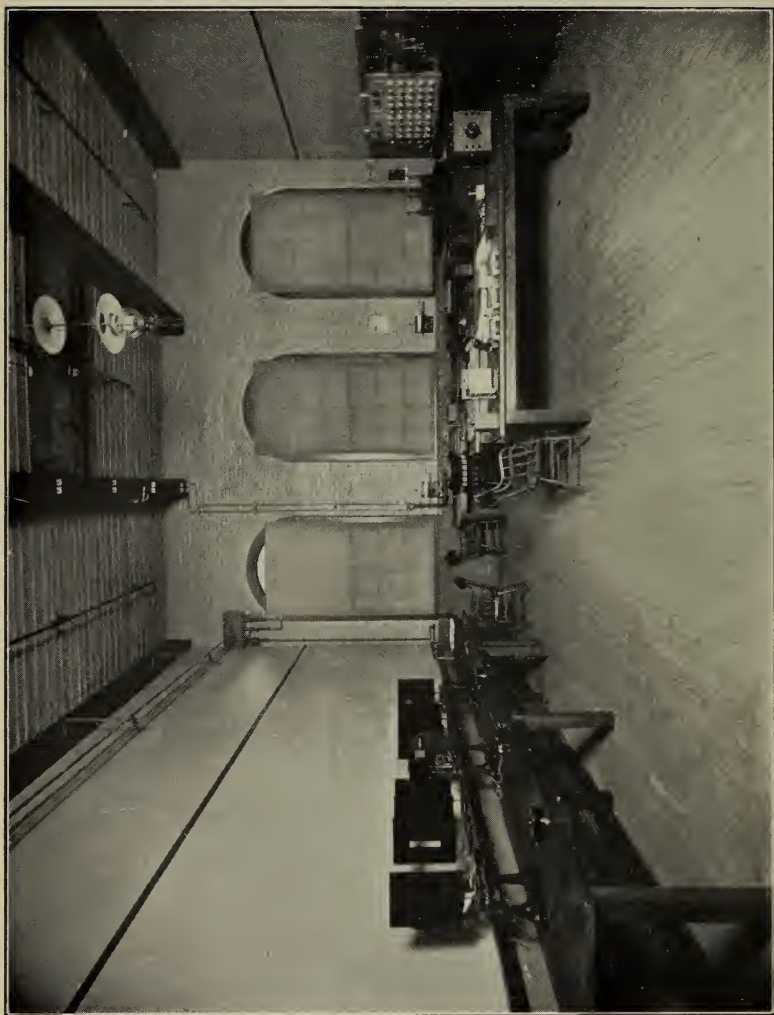
Through the generosity of Mr. Frederick Fanning Ayer, the school has been provided with a Campus and Athletic Field of about three acres. This has been carefully graded and laid out for base ball, foot ball and track athletics. Bleachers have been provided for use at the out-of-door games.

To enclose this field the Alumni Class Fence has been partly built. It is made of forged iron sections supported between brick columns. Each section is contributed by a class, so that in the course of a few years this fence will entirely enclose the field.

In the basement of Kitson Hall there has been provided a recreation room for the use of the students at such times as their attendance is not required in classes. This room is also used by those who take part in athletics, and connected to it is a smaller room provided with shower baths, lockers and toilets. Both rooms are easily accessible to the Campus by way of the outer door of Kitson Hall.

The upper hall of Southwick Hall has been equipped with gymnastic apparatus. Chest weights, wooden dumb bells, Indian clubs, a set of travelling rings, a vaulting horse, parallel bars, a punching bag and several sets of foils and single sticks have been provided.

In order to be sure that no student having any dangerous physical weakness takes part in any athletic contest, all candidates for the various athletic teams are obliged to pass a satisfactory physical examination given by the Medical Adviser of the school.



ELECTRICAL MEASUREMENT LABORATORY

Day Classes

ENTRANCE REQUIREMENTS

Degree Courses

Candidates for admission to either of the degree courses must be graduates of a school approved by the New England College Entrance Certificate Board or by the Board of Regents of New York, and must present a certificate from the principal of the school, reporting upon the subjects pursued and the points obtained according to the schedule of studies given hereafter. A total of fourteen points is required.

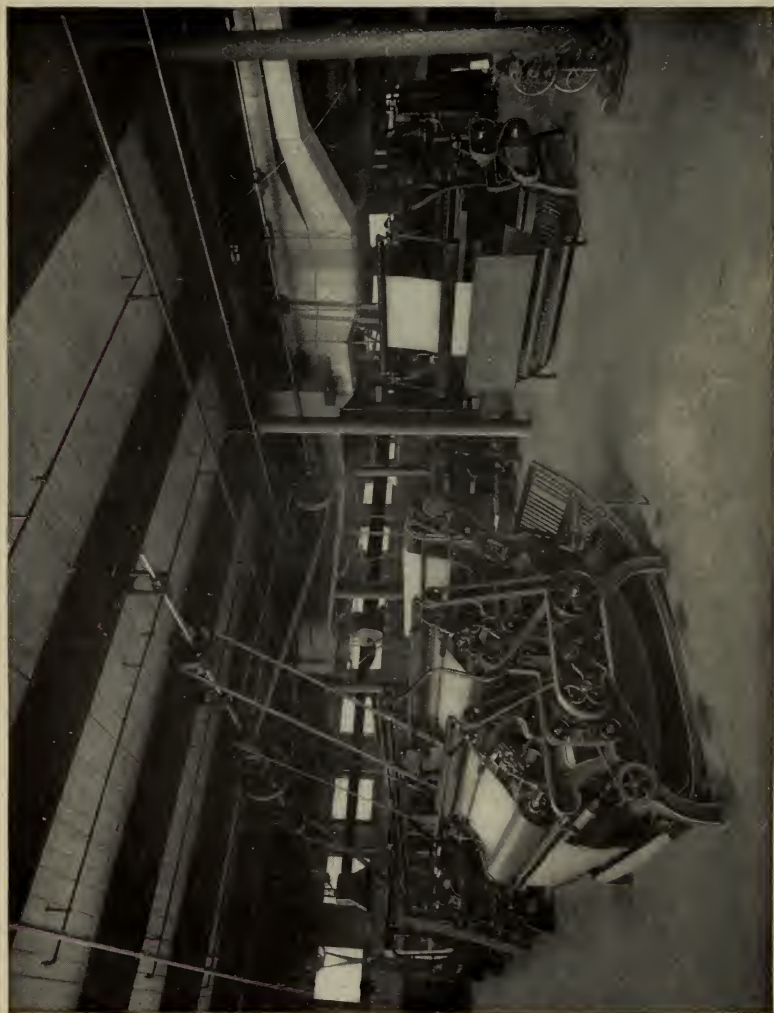
A point represents satisfactory work in a year's study in a specified subject in an approved secondary school.

Required Subjects	POINTS
Plane Geometry	1
Algebra (I Elementary. II Advanced)	2
Elementary German A (two years) or	
Elementary French A (two years)	2
English	3
History	1
	<hr/>
	9

Elective Subjects	POINTS	
Physics	1	
Chemistry	1	
Solid Geometry	1	
Trigonometry	1	
Mechanical Drawing	1	
Mechanic Arts	1	
History	1	
Elementary French or	} Two years	2
Elementary German		
Advanced French or German (one year in addition to requirements of Elementary French A or Elementary German A		
English		1

An applicant may also be admitted on the basis of entrance examinations in which case he must pass sufficient number of the required subjects to make nine points, and present certificates showing satisfactory courses in such of the elective subjects to make five additional points.

The object of the elective requirements is to encourage greater breadth of preparation than that covered by the required branches. Certificates covering other subjects than those listed as elective will be entertained.



KNITTING DEPARTMENT

Diploma Courses

Candidates for admission to the Diploma Courses are accepted upon presentation of properly vouched certificates showing the completion of a regular four year course in a High School or Academy of reputable standing. The certificate must specify that the applicant has satisfactorily passed the necessary subjects.

A total of nine points is required and no applicant for a diploma course can be accepted unless he presents in his certificate at least one year of Algebra, one year of Plane Geometry and three years of English. An applicant is advised to complete both Algebra I and II before entering.

The subject matter covered should be the same as described under the required subjects for the Degree Courses with the exception of German, French and Arithmetic, the requirements for which are given specifically under Elementary German B, Elementary French B and Arithmetic (Diploma Course Requirements).

Subjects	POINTS
Algebra (I Elementary)	I
Algebra (II Advanced)	I
Plane Geometry	I
English (Three Years)	3
English (Additional Year)	I
German (Elementary One Year)	I
French (Elementary One Year)	I
History { American	I
{ English	I
{ Mediaeval and Modern	I
Arithmetic	I

ENTRANCE EXAMINATION

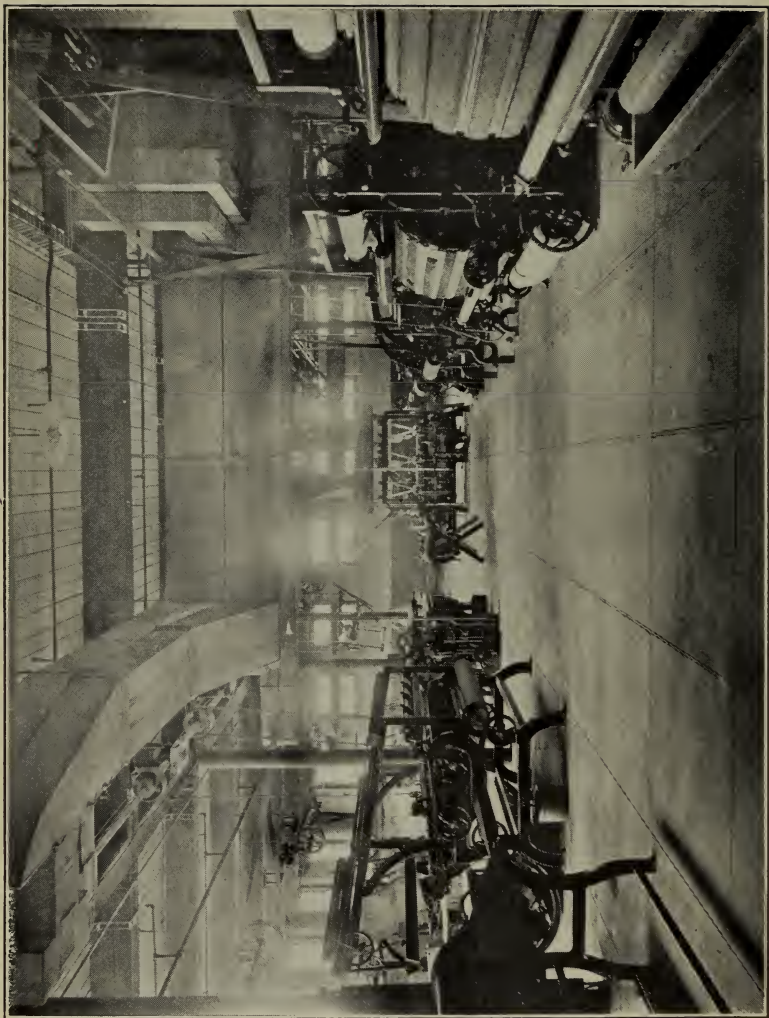
All students who are unable to present a certificate for either the degree or diploma courses must pass entrance examinations. The examinations for admission to the diploma and degree courses will be held as follows:

Monday, June 15, 1914; Tuesday, September 8, 1914; Tuesday, June 15, 1915:

Algebra	9 A. M. to 11 A. M.
History	11 A. M. to 1 P. M.
English	2 P. M. to 4 P. M.

Tuesday, June 16, 1914; Wednesday, September 9, 1914; Wednesday, June 16, 1915:

Plane Geometry	9 A. M. to 11 A. M.
German or French	11 A. M. to 1 P. M.
Arithmetic	2 P. M. to 4 P. M.



FINISHING DEPARTMENT

Applicants who wish to take the degree courses and cannot enter upon certificate must send to the Principal not later than June 9, for June examinations and September 1, for Fall Examinations, a list of the subjects which they offer for examination. The dates for these examinations will be in accordance with the above schedule.

Candidates failing to pass the June examinations are allowed to try again in September; those who cannot attend the June examinations may present themselves in September.

REQUIRED SUBJECTS FOR ENTRANCE

Algebra

I. Fundamental operations, factoring, determination of the highest common factor and least common multiple, fractions, simple and complex, simple equations of one or more unknown quantities, problems involving linear equation of either numerical or literal quantities, radicals, involution, and evolution, square and cube root, ratio and proportion, exponents including fractional and negative.

II. Quadratic equations both numerical and literal. Simple problems involving one or more unknown quantities that may be solved by the methods of linear or quadratic equations, binomial theorem for positive integral exponents, problems involving methods of arithmetical and geometrical progressions.

Plane Geometry

The usual theorems and constructions of good text books including the general properties of plane rectilinear figures, the circle and the measurement of angles similar polygons, areas, regular polygons, and the measurement of the circle. The solution of original problems and problems in mensuration of lines and plane surfaces.

Arithmetic

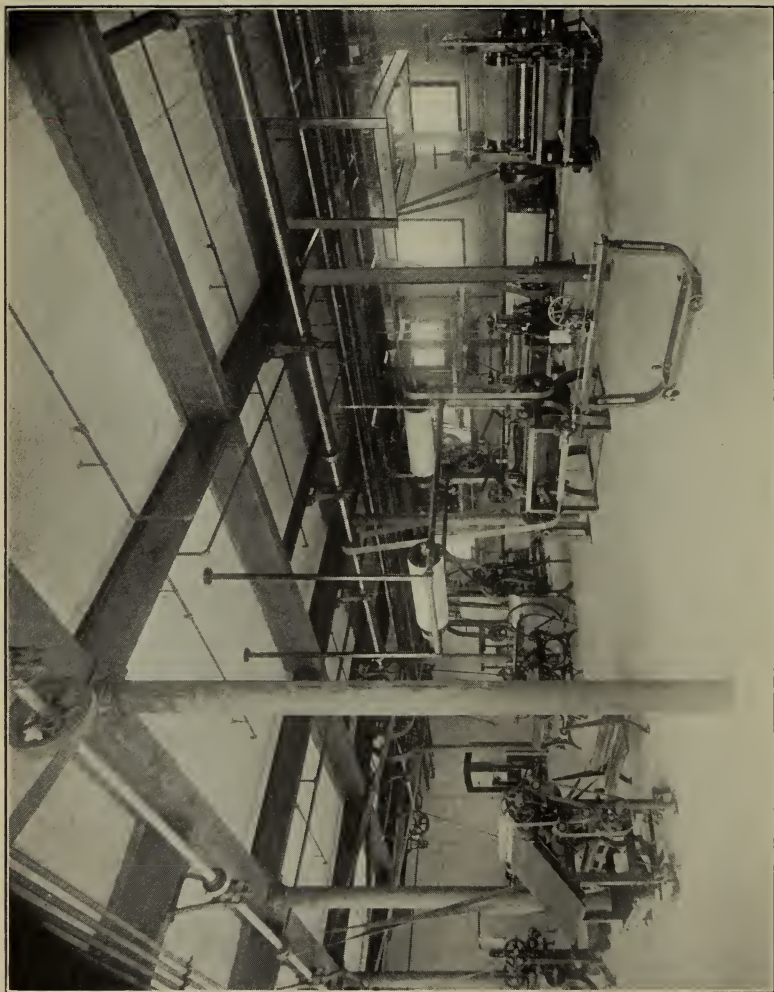
(Diploma Course Requirement)

This subject should be pursued for two reasons: that the applicant may acquire familiarity with the fundamental principles and that he may acquire accuracy in solution. Special attention should be given to problems in percentage, interest, discount, square and cube root, alligation, ratio and proportion, Metric System.

English

As high schools, academies, and preparatory schools are following to a greater extent than heretofore, the requirements of the College Entrance Examination Board concerning the study of English Composition

COTTON FINISHING



and Literature, the applicant to this school should be preparing for entrance examinations to conform to the suggestions of this Board.

The examination consists of two parts, both of which are given at the same time.

(a) With the object of testing the student's ability to express his thoughts in writing clearly and correctly he will be required to write upon subjects familiar to him. Emphasis will be laid upon the composition, punctuation, grammar, idiom and formation of paragraphs. He will be judged by how well he writes rather than by how much he writes.

(b) The second part of the examination is prepared with the view of ascertaining the extent of the student's knowledge of good literature.

For 1914 and 1915, the list of study books is as follows:

Shakespeare's *Macbeth*.

Milton's *L'Allegro*, *Il Penseroso* and *Comus*.

Either,

Burke's *Speech on Conciliation with America*.

or both of the following:

Washington's *Farewell Address*.

Webster's *First Bunker Hill Oration*.

Either,

Macaulay's *Life of Johnson*.

or

Carlyle's *Essay on Burns*.

Modern Languages

REQUIREMENTS FOR DEGREE COURSES

It is expected that the work in these subjects has covered a period of at least two years of preparatory school training or the equivalent. Importance should be given to ability to translate into good idiomatic English, but attention should also be paid to grammar and construction that greater care may be used in translation.

Elementary German A

The entrance examination is composed of two parts, both taken, however, at the same time.

(a) Translation of simple German prose into good idiomatic English.

(b) Questions to test proficiency in grammar and simple English sentences to be rendered into German.



VIEW OF MANUFACTURED MATERIALS

The requirements include the declension of articles, adjectives, pronouns, and nouns; the conjugation and inflection of weak and strong verbs; the simpler uses of the subjunctive; the use of the modal auxiliaries; the prepositions and their uses; the principal parts of important verbs and the elementary rules of syntax and word order.

Among the texts suggested for prospective candidates are:

Anderson's *Marchen*.
Arnold's *Fritz auf Ferien*.
Baumbach's *Die Nonna and Der Schwiegersohn*.
Gerstacker's *Germelshausen*.
Heyse's *L'Arrabbiata*.
Hillern's *Hoher als die Kirche*.
Jensen's *Die braune Erica*.
Storm's *Immensee*.
Zschokke's *Der zerbrochene Krug*.

Elementary French A

The entrance examination is composed of two parts, both taken, however at the same time.

- (a) Translation of simple French prose into good idiomatic English.
- (b) Questions to test proficiency in grammar and simple English sentences to be rendered into French.

The requirements include the principal parts, conjugation and inflection of the regular and the more common irregular verbs; the singular and plural forms of nouns and adjectives; the uses of articles and partitive construction; the forms and positions of personal pronouns; and the simpler uses of the conditional and subjunctive.

Among the texts recommended for prospective candidates are:

About's *Le roi des montagnes*.
Bruno's *Le tour de la France*.
Daudet's *easier short tales*.
De la Bédollière's *La mère Michel et son chat*.
Erckmann — Chatrian's *Madame Thérèse*.
Foa's *Contes Biographiques*.
Halévy's *L'Abbé Constantin*.
Merimée's *Colomba*.
Extracts from *Michelet*.
Sarcey's *Le siège de Paris*.
Verne's *Le tour du monde en quatre-vingts jours*.
Molot's, *sans famille*

Note:—Students who have pursued two years of Elementary French as well as two years of Elementary German may present one subject to cover 2 points in the required subjects and the other to cover 2 points in the elective subjects.



LIBRARY

REQUIREMENTS FOR DIPLOMA COURSES

Elementary French B

Applicants who enter for one of the three year courses may present one year's work in French in a preparatory school. Those who present themselves for examination in this subject should be familiar with the rudiments of grammar and be able to translate simple French prose into good idiomatic English, also to translate into French, English sentences based on the French given for translation.

Elementary German B

Applicants who enter for one of the three year courses may present one year's work in German in a preparatory school. What is stated in regard to French applies to those who may present German instead of French.

History

Applicants may offer a preparation of American History, English History or Mediaeval and Modern History.

In American History applicants should be familiar with the early settlements in America, the colonies, their government, the customs of the people and events which led to the establishment of the United States. They should be informed concerning the causes and effects of the principal wars in which the country has been involved. They should be prepared to consider also questions requiring an elementary knowledge of Civil Government as well as historical facts connected with the growth of this country up to the present time.

For the subjects of English History or Mediaeval and Modern History the courses given in any reputable secondary school should give proper preparation. A course extending over a full year with not less than three periods a week will be accepted.

ELECTIVE SUBJECTS

History

If the applicant can present all three or any two branches of history specified he may include one as a required subject and the others in the list of elective subjects.

Physics

The applicant should be familiar with the fundamental principles of Physics, particularly those considered under the headings of Mechanics, Heat, Light, Electricity and Magnetism. Text book instruction should be supplemented by lecture table experiments. Wherever possible, the student should pursue a laboratory course, but for the present no applicant will be conditioned in this subject if he has not been able to carry

on a laboratory course. Where a laboratory course is offered by a preparatory school, it should cover at least twenty-five of those experiments listed in the syllabus of the College Entrance Examination Board. An applicant should present his note-book together with the certificate from the teacher under whom the work was performed.

Chemistry

Applicants must show evidence of their familiarity with the rudiments of Chemistry. Any course given in a preparatory school organized to present instruction by means of text book or lecture together with co-related laboratory work will be considered as covering the requirements. The applicant's note book with his original notes including description of experiments, apparatus used, reaction, observation, and deductions, must be accompanied by his instructor's certificate.

Importance will be placed upon manipulation and deductions as well as the general appearance and neatness of the note-book.

Solid Geometry

The usual theorems and constructions of good text books including the relations of planes and lines in space, the properties and measurement of prisms, pyramids, cylinders, and cones; the sphere and spherical triangles. The solution of original problems and the applications of the mensuration of surfaces and solids.

Trigonometry

The usual courses of instruction covered by the standard text books on Plane and Spherical Trigonometry will prepare an applicant sufficiently to meet this requirement.

Mechanical Drawing

The applicant must have pursued such a course in Mechanical Drawing that he will be familiar with the usual Geometrical Construction, Problems, Projection of Points, Lines, Planes, and Simple Solids.

Importance is laid not only upon the accuracy with which the work is performed but upon the general arrangement, appearance, and care with which the plates are executed.

Applicants are advised not to offer this subject as equivalent of the first term's work at the school.

Mechanic Arts

The usual courses offered by properly equipped preparatory schools will be accepted as suitable fulfillment of this requirement. Work should include instruction in the handling of both wood and metal working tools in the more simple practices of these arts.

Advanced French or German

In cases where applicants have pursued courses in French or German for more than two years, and have completed work which is more advanced than is included under Elementary French or German, they may offer the additional year as an elective.

English

In many preparatory schools this subject is required during all of the four years, and where it is pursued to this extent the applicant may offer the additional year's work as one of his elective subjects.

GENERAL INFORMATION

Preparation

Particular stress is laid upon a thorough grounding in mathematics including Algebra, Arithmetic and Plane Geometry, as these form the basis upon which the work of this school rests. While Solid Geometry is not required at the present time, the student will find a knowledge of this subject very valuable in his subsequent work and is strongly recommended to include this subject as one of his electives. A preliminary course in science, including Physics and Chemistry, serves to prepare the student's mind for the higher branches of these subjects and their application, but neither will be considered as the equivalent of the courses in these branches given in the school.

Advanced Standing

Candidates who may have received previous training in any of the subjects ordinarily taken in the regular course may present themselves for examination as per calendar. If a satisfactory rank be attained, they may elect such further work as their preparation will permit.

Attendance Card

At the beginning of each term all students must fill out and file with the Principal on blank forms which are provided, a formal application for such subjects as are required in his course and for which he is sufficiently prepared, subject to the approval of the Principal. When an attendance card is once approved, no change can be made except through the Principal.

Application Blanks

A blank form of application for admission may be found at the end of this bulletin. This should be properly filled out by all applicants whether entering upon certificate from a preparatory school or presenting themselves for examinations.

Fees

The fee for the day course is \$105 per year for residents of Massachusetts, with the exception of the Chemistry and Dyeing Course, for which the fee is \$130 for Second and Third Year students. For First Year students taking the Chemistry and Dyeing Course the first term fee is \$63 and the second term fee \$54.50. For non-residents the fee for all courses is \$155 per year. The fee for students from foreign countries is \$305 per year.

Three-fifths of the fee is charged for a single term and is payable on or before October 10, the balance on or before February 10, of each year. *No bills will be sent.* Students attending but one term will be charged three-fifths of the yearly fee. After payment is made, no fee or part thereof can be returned, except by special action of the Trustees.

Special students pay, in general, the full fee, but if a course be taken involving attendance at the school during a limited time, application may be made to the Principal for a reduction.

Students must provide their own books, stationery, tools, etc., and pay for any breakage or damage that they cause. The above fee includes free admission for any day students desiring to attend any of the evening classes in which there is accommodation.

For all first year students a minimum deposit of \$20 is required to cover the cost of breakage in the chemical laboratory, the unexpended balance to be returned to the student at the end of the year.

For all students in second or third years taking work in Chemistry or Dyeing Laboratories a deposit of \$15 per term is required. The unexpended balance will be returned at the end of the year.

Fees are strictly payable in advance, and students whose fees remain unpaid after the above mentioned dates will not be admitted to classes.

All deposits must be made before students can be admitted for laboratory work.

Examinations

Examinations are held at the end of each term.

In general, the examinations cover the work of the preceding term, but at the end of the third year, candidates for diplomas may be examined on all the preceding three years' work.

Examinations for students conditioned in first term subjects are held in May and examination for students conditioned in the Final Examinations are held in September following.

If a student fails to clear a condition at the time appointed, he will be required to repeat or drop the subject; and he cannot be admitted to subjects dependent thereon.

Intermediate examinations are held every five weeks and these serve to inform the student concerning his standing and the progress made.

Daily work and regularity of attendance are considered in making up the reports of standing.

Continued or persistent absence or tardiness from the classes is considered reason to exclude a student from the class.

Records and Reports of Standing

Twice during each term informal reports are sent to all parents or guardians and to students who are of age; and at the end of each term formal reports are made.

The daily work of the student forms an important part of his record, and no pupil will be awarded the diploma unless this portion of his record is clear.

Books are prescribed for study, for entry of lecture notes and other exercises, and are periodically examined by the lecturers. The care and accuracy with which these books are kept are considered in determining standing.

Thesis

All candidates for the degrees of the school must file with the Principal not later than May 15, a report of original investigation, or research, written on a good quality of paper, 8 x 10 inches, with one inch margin at left, and 1-2 inch at right of each page; such thesis to have been previously approved by the head of the department in which it is made.

For all candidates for the diploma this requirement will be optional on the part of the school.

Graduate Course

Graduates of technical courses of other schools are invited to communicate with the Principal with reference to special courses in the textile studies. Previous training in the engineering branches will usually reduce materially the time necessary to complete any of the courses at this school. The advantages offered to such persons for special research work are unexcelled, and a most profitable course may be arranged.

Partial Courses

While it is assumed that in general every student will pursue some one of the regular courses it is recognized that there may be some who because of special vocations or limited time desire to obtain instruction in certain particular subjects. Facilities and special courses will be provided for such applicants within the limits of schedule arrangements and required preparation. For subjects and preparation see page 109.

Applicants must present satisfactory evidence by examination or otherwise that he is qualified to pursue with profit the subjects chosen.

For a number of years the school has had students who have specialized in Textile Design, Decorative Art, Cloth Analysis, Weaving and Finishing. While no specified limit is given for this course the usual time has been three years. It is expected that students taking this course will devote all of the regular school session to these subjects and failure to attend, continued tardiness, lack of application or progress will be considered sufficient reasons to demand his withdrawal from the school.

Special Awards of Merit

For several years a friend of the school has offered prizes in the form of books to be awarded to the successful candidates on graduation day. The prizes are continued each year. The conditions in detail are as follows:

First:—Ten dollars to the student taking the regular Chemistry and Dyeing Course who shall be considered as having attained the highest scholarship in First Year Chemistry.

Second:—Five dollars to the student taking the regular Chemistry and Dyeing Course who shall be considered as having attained the second highest scholarship in First Year Chemistry.

Third:—Ten dollars to the regular student of the Chemistry and Dyeing Course who shall be considered as having attained the highest scholarship during his second year.

Fourth:—Five dollars to the regular student of the Chemistry and Dyeing Course who shall be considered as having attained the second highest scholarship during his second year.

Fifth:—Twenty dollars to the regular student in the Chemistry and Dyeing Course who shall present the best Thesis preparatory to graduation.

The above mentioned sums are to be invested in books which may be selected after graduation. In case no one is considered worthy of any particular scholarship prize or if there is no competition, the same may be withheld. The decision in such case shall rest with the judges.

Prize Offers for Textile Designs

The Arlington Mills make the following prize offers for textile design to all members of the day classes, providing that there are at least two contestants, and to all members of the evening classes, providing that there are at least two contestants:

First and second prizes will be given to the winners in each contest.

First:—Cash prize of \$25.00 to the student who presents the best design with full specifications which is suitable for worsted dress goods fabrics for women's wear.

Second:—Cash prize of \$15.00 to the student who presents the second best design, with full specifications, applicable to the above fabrics.

Any contestant may present not more than five different designs for any one of the above mentioned fabrics.

No contestant will be eligible for more than one prize.

Specifications should be made upon standard thesis paper. Only one side should be used and subject matter should be either typewritten or presented in a clear legible handwriting. With each design a statement must be submitted telling the kind of fabric and finish intended.

Any or all designs submitted may be retained by the donors and may become their property.

The judges will be appointed by the Arlington Mills.

All designs must be delivered to the Arlington Mills, 78 Chauncy Street, Boston, on or before May 15, accompanied by a sworn statement that the contestant has received no help and that the designs are entirely his own work, the object of the contest being to develop originality in the student.

The full name of a contestant must appear on the designs and specifications. In judging the relative merit of the various designs the neatness and care with which they are executed will be considered as well as the value of the designs from a manufacturer's point of view.

Degrees

The degree of Bachelor of Textile Engineering will be awarded for the completion of the four-year course in Textile Engineering. The degree of Bachelor of Textile Dyeing will be awarded for the completion of the four-year course in Chemistry and Textile Coloring.

Diploma

For the present the diploma of the School will be awarded upon the satisfactory completion of any one of the regular courses, covering not less than three years, except where entrance is to advanced standing. In such cases at least one year's attendance is required.

Medals of Honor

The National Cotton Manufacturers' Association offers annually a medal to that member of the third year class who shall have during his course attained the highest standing in the specified subjects required by the vote of the association.

Attendance

All regular students must attend all exercises of their course. Special students must attend exercises as per their Tabular View.

In case of absence explanation must be made to the instructor or the Head of the Department. The effect of such absence upon a student's standing in the respective study will rest with the Head of the Department subject to the approval of the Principal.

If a student absents himself from any department to such an extent that in the mind of the Head of the Department he is endangering his standing, he shall be reported to the Principal.

If he continues his non-attendance, he may be required to drop the subject and repeat it the following year.

If he is reported from several departments on account of non-attendance, he may be suspended from the school for the remainder of the school year.

Conduct

Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order. All breakages, accidents, or irregularities of any kind must be reported immediately to the head of the department, or instructor in charge.

In case of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly or ungentlemanly conduct or general insubordination, are considered good and sufficient reason for the immediate suspension of a student, and a report to the Trustees for such action as they deem necessary to take.

It is the aim of the Trustees so to administer the discipline of the school as to maintain a high standard of integrity and a scrupulous regard for trust. The attempt of any student to present as his own, work which he has not performed, or to pass any examination by improper means, is regarded by the Trustees as a most serious offense and renders the offender liable to immediate suspension or expulsion. The aiding or abetting of a student in any dishonesty is also held to be a grave breach of discipline.

Any student who violates these provisions will be immediately suspended by the Principal and the case reported at the following meeting of the Trustees for action.

Young men abounding in vitality when suddenly cut loose from home and established social environment to acquire an education at a residential school, need especially the careful direction of more mature minds in the formation of new associations. The management of all residential schools are aware that this fact is the cause of considerable anxiety on the part of parents and guardians. The responsibility thus placed upon those under whose care these pupils are committed is profoundly recognized.

The public schools are for boys and girls, the college for youth, the higher technical and professional schools of medicine, law, engineering, etc., are for men. It is now fully recognized that the fundamental idea of the general educational system, from the kindergarten to the college

inclusive, should be the development and establishment of character, and it is therefore expected that those entering the technical schools will have made some progress in self-respect, self-denial and self-control. They enter substantially upon their life work when they matriculate at the higher technical schools and may be placed on their honor as to conduct and not be subject to an irritating and humiliating system of espionage outside of school hours.

In place of such espionage it is the policy of technical schools to rely mainly upon the discipline of the work of the course in connection with facilities for physical exercise in the various athletic games and sports, for which ample provision has been made at this school.

Pupils often err in conduct from thoughtlessness and lack of experience rather than through wilfulness, and unconsciously fall into bad habits because of the lack of intelligent warning and instruction. For this reason, it is proposed to give thorough instruction by lectures, covering the subjects of hygiene, the preservation of physical vigor, morals, thrift and the duties of citizenship. A careful scrutiny will also be maintained by the instructing staff in order to detect in the students any tendency of relaxation in the work or attendance, and all reasonable effort will be made to maintain a high standard of scholarship and morals.

Library

The school library is supplied with leading textile books and with works dealing with science, art or industries allied to the textile trades. The leading textile papers are kept on file.

Sessions

The regular school sessions are in general from 8.30 a. m. to 12.30 p. m., and from 2 to 4.30 p. m., except Wednesdays and Saturdays when there is no session of the school in the afternoon. On Saturday afternoons the buildings are closed.

A tabular view designates the hours at which the various classes meet. This is rigidly adhered to and the student is marked for his attendance and work as therein scheduled.

Residence and Expenses

Students from a distance, requiring rooms and board in the city, may if they desire, select the same from a list which is kept at the School. The cost of rooms and board in a good district is from \$6.50 per week upwards.

All raw stock and yarn provided by the School, and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student is allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated

in accordance with the requirements of the school. It is understood that the Trustees may retain in the School such specimens of student's work as they may determine.

Lockers are provided for the use of the students, sufficiently capacious to contain clothing, books and tools. The student must provide a good padlock with duplicate keys, one of which must be delivered at the school office where it will be preserved for use while the student remains at school.

No books, instruments, or other property of the School are loaned to the students to be removed from the premises except by special permission.

Awards

Gold Medal, Paris Exposition, 1900, for general excellence. A special Medal, Merchants and Manufacturers Exposition, Boston, 1900. The Pan-American Medal awarded to the School, 1901. Gold Medal, Louisiana Purchase Exposition, 1904, Gold Medal, Lewis and Clarke Centennial Exposition, 1905.

Bulletins and Catalogues

All students registering and paying the regular fee for the course selected are entitled to the Bulletins and Catalogues when issued.

Courses of Instruction

Since its establishment, the Lowell Textile School has offered courses, each of which extends over a three year period. With the development of the school and close study of the problems presented to the graduates, it has been believed that attention should be given those branches of instruction which would give breadth of training as well as establish fundamental principles. This policy has resulted in extending the curriculum to such length that the need for an additional year's instruction was evident.

The fact was also appreciated that to carry on the more advanced work the better preparation must be demanded of the applicant for entrance.

Nevertheless it was recognized that many young men seeking employment in the textile industry do not care, or are not in a position to devote four years to scholastic preparation, and for these the regular three year courses are offered.

These courses are designated as:—

Cotton Manufacturing.

Wool Manufacturing.

Textile Design (General Textile Courses)

Chemistry and Dyeing.

Textile Engineering.

At the completion of any one of these the regular diploma of the school is awarded.

In general it is assumed that students pursuing these courses will not take the advanced work of the fourth year. However, if a student electing one of the three year courses desires to change to one of the four-year courses he may do so providing his preparation and undergraduate standing permits of it.

For those who desire and who have the proper entrance qualifications to pursue the more advanced work in Textile Engineering, and Chemistry and Textile Coloring, four-year courses are offered at the completion of which the degrees of Bachelor of Textile Engineering (B. T. E.) and Bachelor of Textile Dyeing (B. T. D.) are conferred.

Three options are offered in the Engineering Course, viz: General Textile, Cotton Manufacturing, or Wool Manufacturing. Each of these courses is planned to train one in the fundamental principles of science found to be applicable in the particular fields of Textile Chemistry and Textile Engineering. It is maintained that for one to be successful in either of these important branches of industry, as thorough and broad a training is required as in any of the recognized branches of engineering or of applied science.

With this in mind these courses have been built of a secure framework of science and mathematics, and to it has been added the useful application of those branches in the broad textile field. With the direct purpose of laying a secure foundation in the training a more extended and advanced preparatory course is first demanded, and subsequently in the school work more subjects of a general character are included, that narrowness of judgment and observation may not result by over stimulation of the technical development.

COURSES FOR WOMEN

Although all classes are open to women the courses which have appealed especially to their tastes have been Textile Designing and Decorative Art. Some have pursued courses in Chemistry and have added to their work in Design some instruction in Power Weaving and Finishing. These special courses have in general been followed for three years and in some cases have led the students to positions either in the mill office or in some commercial lines that have been desirable and have offered congenial work.

As the school work is made special to meet the needs of each case, no prescribed course of study is given in this catalogue. Inquiries should be made of the Principal.

Courses

In the column headed "Hours of Exercise" the numbers represent for each particular subject the total hours required for a period of fifteen weeks.

The letter and number which follow the subjects indicate the department in which the subject is given and the number of the subject in that department. For detailed description of the same, see page 109.

The departments are indicated as follows:

Textile Engineering	B	Cotton Yarns	F
Chemistry and Dyeing	C	Woolen and Worsted Yarns	G
Textile Design and Power		Finishing	H
Weaving	D	Physical Culture	I
Languages and History	E		

By referring to the letter and number indicated under "Preparation" the student can ascertain what subjects are necessary in order that he may have a clear understanding of the subject which he is scheduled to take.

FIRST YEAR

FIRST TERM

(Common to all courses)

	Hours of Exercise
Mechanism B-3	60
Mechanical Drawing B-7	75
Mathematics B-1	45
Textile Design D-1	75
Elementary Chemistry C-1	150
English E-1	30
Elementary German E-2 or Elementary French E-4	30
Physical Culture I-1	30

SECOND TERM

	Courses I-4	Courses II-4
Mechanism B-3	45	45
Mechanical Drawing B-8—B-9	98	30
Mechanical Laboratory B-6	37	—
Mathematics B-1	45	30
Textile Design D-1	60	30
Elementary Chemistry C-1	75	75
Cotton Yarn F-1 or Wool Yarn G-1	60	—
English E-1	30	30
Elementary German E-2 or Elementary French E-4	30	37
Physical Culture I-1	30	30
Qualitative Analysis C-2	—	173
Stoichiometry C-3	—	30

For second term subjects in three-year courses see pages 99-107.

COURSE I-4.—TEXTILE ENGINEERING

At the organization of the school four major courses were offered but with the growth of the school a demand was felt for instruction in engineering subjects supplemented by a study of textile machinery and processes. A three year course to meet this demand was offered and the development of this through a study of the possible requirements of a Textile Engineer has made evident a broader course of four years which leads to the degree of Bachelor of Textile Engineering (B. T. E.).

The subjects of the first year which are substantially the same for all courses are intended to lay the foundation for the subsequent dependent instruction in the applied courses. Hence, the subjects of Mathematics, Chemistry, Mechanism, and Mechanical Drawing not only operate to develop the mind and stimulate accurate thinking, but also set forth the principles which are later to be used in a clear understanding of machines and methods. The course in Elementary Designing acquaints the student with textile fabrics and their construction. The subjects of English and one foreign language give the student a better understanding of his own language that he may express himself clearly, and by acquaintance with a foreign language he may obtain information not available in his own tongue.

In the second term instruction in Cotton Yarn Manufacturing commences. This is continued into the second year followed in the succeeding years by Wool Manufacturing, Weaving, and Finishing. Chemistry of the first year develops into Textile Chemistry and Dyeing of the second year, and during this year an advanced course of Physics is given, leading to Electrical Engineering and its application in the textile industry. Mathematics are finished with the third year and during the course the branches of higher Algebra, Trigonometry, Analytical Geometry, and Calculus are studied with particular reference to the solution of engineering problems, as found in the subjects of Applied Mechanics, Electrical, Heat, and Mill Engineering, which are a part of the second, third, and last years' work.

The fourth year permits of a pursual of more advanced work in Mill Engineering, Electrical and Heat Engineering, as well as some further instruction in those textile processes of Cotton and Worsted Spinning, Cotton Finishing, etc., for which three years' time does not permit. It is also proposed to offer general courses of Business Law, Accounting and Principles of Efficiency Engineering under the head of Business Administration.

For detailed description of the subjects see page 109.

COURSE I-4.—TEXTILE ENGINEERING

General Textile Option

(For First Year see page 91)

SECOND YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Textile Chemistry and Dye- ing	C-9 30	Engineering Laboratory	B-14 37
Physics	B-11 30	Weaving Mechanism	B-5 30
Mathematics	B-2 45	Shop Work	B-15 75
Machine Drawing	B-10 105	Cotton Yarn Manufacture	F-1 75
Steam Engineering	B-12 45	Advanced German	E-3-5 30
		Industrial History	E-6 15

SECOND TERM

Textile Chemistry and Dye- ing	C-9 15	Steam Engineering	B-14 52
Physics	B-11 45	Shop Work	B-15 60
Mathematics	B-2 45	Wool Yarn Manufacture	F-1 105
Strength of Materials	B-4 30	Advanced German	E-3-5 30
Machine Drawing	B-10 75	Industrial History	E-6 15
		Power Weaving	D-9 30

THIRD YEAR

FIRST TERM

Electrical Engineering	B-19 38	Power Weaving	D-9 45
Machine Shop Practice	B-15 60	Cotton Finishing	H-2 30
Engineering Laboratory	B-14 37	Mathematics	B-2 45
Woolen and Worsted Yarn Manufacture	G-1 120	Mill Engineering	B-17 68
Economics	E-7 30	Woolen and Worsted Finishing	H-1 67

SECOND TERM

Hydraulics	B-13 15	Cotton Finishing	H-2 15
Electrical Engineering	B-19 60	Woolen and Worsted Yarn Manufacture	G-1 97
Mill Engineering	B-17 75	Woolen and Worsted Finishing	H-1 30
Machine Shop Practice	B-15 60	Economics	E-7 30
Engineering Laboratory	B-14 68		
Mathematics	B-2 45		

FOURTH YEAR

FIRST TERM

Cotton Yarn Manufacturing	F-1 75	Business Administration	E-8 82
Mill Engineering	B-17 75	Textile Testing	G-2 30
Electrical Engineering	B-19 82	Strength of Materials	30
Woolen and Worsted Yarn Manufacture	G-1 75		

SECOND TERM

Cotton Yarn Manufacturing	F-1 60	Business Administration	E-8 97
Mill Engineering	B-17 60	Thesis	75
Electrical Engineering	B-19 67	Textile Testing	G-2 45
Cotton Finishing	H-2 67	Strength of Materials	30

COURSE I-4.—TEXTILE ENGINEERING

Cotton Option

(For First Year see page 91)

SECOND YEAR

		FIRST TERM			
		Hours of Exercise		Hours of Exercise	
Textile Chemistry and Dye- ing	C-9	30	Weaving Mechanism	B-5	30
Physics	B-11	30	Shop Work	B-15	75
Mathematics	B-2	45	Cotton Yarn Manufacture	F-1	68
Machine Drawing	B-8	75	Cotton Design	D-2	30
Engineering Laboratory	B-14	37	Advanced German	E-3, 5	30
Steam Engineering	B-12	45	Industrial History	E-6	15

		SECOND TERM			
Textile Chemistry and Dye- ing	C-9	15	Shop Work	B-15	60
Physics	B-11	45	Cotton Yarn Manufacture	F-1	83
Mathematics	B-2	30	Cotton Design	D-2	45
Strength of Materials	B-4	30	Power Weaving	D-9	30
Machine Drawing	B-8	75	Advanced German	E-3, 5	30
Steam Engineering	B-12	52	Industrial History	E-6	15

THIRD YEAR

		FIRST TERM			
Electrical Engineering	B-20	38	Power Weaving	D-9	60
Machine Shop Practice	B-15	60	Economics	E-7	30
Mill Engineering	B-17	68	Engineering Laboratory	B-14	37
Cotton Yarn Manufacture	F-1	127	Mathematics	B-2	45
Cotton Design	D-6, 7	45			

		SECOND TERM			
Hydraulics	B-13	15	Cotton Design	D-6, 7	45
Electrical Engineering	B-20	75	Power Weaving	D-9	45
Machine Shop Practice	B-15	60	Economics	E-7	30
Mill Engineering	B-17	90	Engineering Laboratory	B-14	68
Cotton Yarn Manufacture	F-1	82			

FOURTH YEAR

		FIRST TERM			
Mill Engineering	B-17	75	Cotton Finishing	H-2	30
Electrical Engineering	B-20	82	Power Weaving	D-10	30
Cotton Yarn Manufacture	F-1	75	Business Administration	E-8	82
Strength of Materials		30	Textile Testing		30
Cotton Design	D-6, 7	45			

		SECOND TERM			
Cotton Yarn Manufacturing	F-1	60	Textile Testing		45
Mill Engineering	B-17	60	Cotton Finishing	H-2	67
Electrical Engineering	B-20	67	Business Administration	E-8	97
Strength of Materials		30	Thesis		75

COURSE I-4.—TEXTILE ENGINEERING

Wool Option

(For First Year see page 91)

SECOND YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Textile Chemistry and Dye- ing	C-9 30	Shop Work	B-15 75
Physics	B-11 30	Woolen and Worsted Yarn Manufacture	G-1 68
Mathematics	B-2 45	Woolen and Worsted Design	D-3 30
Machine Drawing	B-8 75	Advanced German	E-3, 5 30
Weaving Mechanism	B-5 30	Industrial History	E-6 15
Engineering Laboratory	B-14 37		
Steam Engineering	B-12 45		

SECOND TERM

Textile Chemistry and Dye- ing	C-9 15	Woolen and Worsted Yarn Manufacture	G-1 83
Physics	B-11 45	Woolen and Worsted Design	D-3 45
Mathematics	B-2 30	Power Weaving	D-9 30
Strength of Materials	B-4 30	Advanced German	E-3, 5 30
Machine Drawing	B-8 75	Industrial History	E-6 15
Shop Work	B-15 60		
Steam Engineering	B-12 52		

THIRD YEAR

FIRST TERM

Electrical Engineering	B-20 38	Woolen and Worsted Design	D-6, 7 45
Machine Shop Practice	B-15 60	Power Weaving	D-9 60
Mathematics	B-2 45	Economics	E-7 30
Mill Engineering	B-17 68	Engineering Laboratory	B-14 37
Woolen and Worsted Yarn Manufacture	G-1 127		

SECOND TERM

Hydraulics	B-13 15	Woolen and Worsted Yarn Manufacture	G-1 82
Electrical Engineering	B-20 75	Woolen and Worsted De- sign	D-6, 7 45
Mill Engineering	B-17 90	Power Weaving	D-9 45
Machine Shop Practice	B-15 60	Economics	E-7 30
Engineering Laboratory	B-14 68		

FOURTH YEAR

FIRST TERM

Mill Engineering	B-17 75	Woolen and Worsted Finishing	H-1 30
Electrical Engineering	B-20 82	Power Weaving	D-10 30
Worsted Yarn Manufacture	G-1 75	Business Administration	E-8 82
Strength of Materials	30	Textile Testing	30
Woolen and Worsted Design	D-6, 7 45		

SECOND TERM

Mill Engineering	B-17 60	Woolen and Worsted Finishing	H-1 67
Electrical Engineering	B-20 67	Business Administration	E-8 97
Worsted Yarn Manufacture	G-1 60	Thesis	75
Strength of Materials	30	Textile Testing	45

COURSE II-4.—CHEMISTRY AND TEXTILE COLORING

The Four Year Course in Chemistry and Textile Coloring leading to the degree of B. T. D. is especially intended for those who wish to engage in any branch of Textile Chemistry, Textile Coloring, Bleaching, Finishing, or the manufacture and sale of the dyestuffs or chemicals used in the textile industry. The theory and practice of all branches of dyeing, printing, bleaching, scouring, and finishing are taught by lecture work supplemented with a large amount of experimental laboratory work and actual practice in the dye-house and finishing room.

The underlying theories and principles of chemistry are the same no matter to what industry the application is eventually made. Furthermore, no industry involves more advanced and varied applications of the science of chemistry than those of the manufacture and application of the coal-tar coloring matters. In addition, the Textile Colorist must consider the complex composition of the textile fibres, and the obscure reactions which take place between them and the other materials of the textile industry.

During the first year General Chemistry including both Inorganic and Organic is taught by lectures and laboratory work, and this is supplemented during the second term by Qualitative Analysis and Stoichiometry.

Advanced Inorganic Chemistry as well as Advanced Organic Chemistry are studied throughout the second year as a continuation of the Elementary Chemistry of the first year, and much time is spent upon Quantitative Analysis, Industrial Chemistry, and Textile Chemistry and Dyeing.

The foundation work in General Chemistry is continued during the third year with courses in Physical Chemistry, Organic laboratory work, and analytical work. The subject of Industrial Chemistry is introduced and much time is devoted to Advanced Textile Chemistry, Dye Testing, Color Matching, Calico Printing, and Woolen, Worsted, and Cotton Finishing.

The fourth year is characterized by an endeavor to present certain subjects of a more applied nature in such a manner that the student's reasoning power and ability to apply the knowledge gained during the first three years may be developed to the fullest extent. The subject of Engineering Chemistry is introduced and the work in the Dyeing and Analytical laboratories is applied as far as possible to the actual requirements of the factory chemist and colorist. The student is given a thorough course in Microscopy, Photomicrography and the use of the various instruments such as the Spectroscope, Ultra-microscope, Polariscope, Tintometer, etc., which often prove of vital importance in the advanced study of Textile Chemistry. During this fourth year, the student must devote much time to research work, or the original investigation of some assigned subject, upon which he must present a satisfactory thesis, or report, before receiving his degree.

For detailed description of the subjects see page 109.

COURSE II-4.—CHEMISTRY AND TEXTILE COLORING

(For First Year see page 91)

SECOND YEAR

		FIRST TERM			
		Hours of Exercise		Hours of Exercise	
Advanced Inorganic Chemistry	C-4	45	Steam Engineering	B-12	45
Textile Chemistry and Dyeing	C-9	68	Physics	B-11	30
Quantitative Analysis	C-6	150	Industrial History	E-6	15
Industrial Laboratory	C-12	105	Advanced German	E-3	30
			Power Weaving	D-9	22

SECOND TERM

Advanced Inorganic Chemistry	C-4	30	Advanced Organic Chemistry		45
Textile Chemistry and Dyeing	C-9, 10	218	Physics	B-11	45
Quantitative Analysis	C-6	127	Industrial History	E-6	15
			Advanced German	E-3	30

THIRD YEAR

		FIRST TERM			
Advanced Textile Chemistry and Dyeing	C-14	225	Advanced Organic Chemistry	C-5	45
Industrial Chemistry	C-13	30	Woolen and Worsted Finishing	H-1	30
Quantitative Analysis	C-7	150	Technical German	C-21	30

SECOND TERM

Advanced Textile Chemistry and Dyeing	C-14	150	Organic Chemistry Laboratory	C-15	105
Industrial Chemistry	C-13	30	Woolen and Worsted Finishing	H-1	60
Quantitative Analysis	C-7	120	Technical German	C-21	30
Physical Chemistry,	C-8	30			

FOURTH YEAR

		FIRST TERM			
Physical Chemistry	C-8	15	Organic Chemistry Laboratory	C-15	120
Quantitative and Industrial Analysis	C-7, 17	75	Technical German	C-21	30
Advanced Textile Chemistry and Dyeing	C-14	90	Advanced Organic Chemistry (Dyestuffs)	C-20	15
Engineering Chemistry	C-16	15	Thesis	C-19	150

		SECOND TERM			
Quantitative and Industrial Analysis	C-7, 17	75	Microscopy and Photomicrography	C-18	75
Organic Chemistry Laboratory	C-15	120	Thesis	C-19	225

COURSE 1-3.—COTTON MANUFACTURING

The Cotton Manufacturing Course is designed for students contemplating a career in the manufacturing of cotton yarns and cloths or allied industries and who wish to devote but three years to the school work.

During the first year, the studies are common to all courses and include instruction in mechanism, mathematics, mechanical drawing, textile design and elementary chemistry. Laboratory work supplements the lectures in chemistry and hand loom weaving assists in illustrating the principles of textile design.

The work in the Cotton Yarn Department comprises instruction in all the manufacturing processes from the bale to the finished yarn. The instruction is given by means of lectures upon the machines and processes, and by laboratory work upon the machines themselves. In the laboratory each student is required to make exhaustive tests upon each machine and to make as many settings and adjustments as possible. The third year's work in this department is largely devoted to lectures upon the manufacture of specialties, waste products, etc., and special laboratory work, special tests upon yarns and fabrics, mill planning with regard to the arrangement of machinery and other work of an advanced nature.

The course in chemistry consists of lecture and laboratory work on inorganic and organic chemistry followed by instruction in textile chemistry and dyeing, including a short course in the dyeing laboratory.

The work in mechanism serves as a basis for all future machine and mechanical work and is followed by steam engineering, electricity, hydraulics and mill engineering. The mechanical drawing taken in connection with these subjects augments this instruction as well as provides opportunity for students to become skilled in draughting.

The course in textile designing, cloth analysis, and cloth construction includes lectures on plain and fancy weaves and Jacquard work, the analysis of all commercial fabrics, and designs for the same. During the third year of this course students in this department specialize on cotton fabrics.

Power weaving is taken up during the second and third years. Commencing with lectures and practice upon plain looms, the student is taken through dobby and box-loom weaving to Jacquards.

A course in knitting taken during the third year includes the manufacture of hosiery and underwear. There is also a course on the finishing of cotton fabrics which is given by lectures and laboratory work.

For detailed description of the subjects see page 109.

COURSE 1-3.—COTTON MANUFACTURING

(For First Term see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise			Hours of Exercise	
Mechanism	B-3	45	Elementary Chemistry	C-1	75
Mechanical Drawing	B-8	75	Elementary German or	E-2	37
Mathematics	B-1	30	Elementary French	E-4	
Textile Design	D-1	83	Physical Culture	I-1	30
Cotton Yarn Manufacture	F-1	105	English	E-1	30

SECOND YEAR

FIRST TERM

Cotton Yarn Manufacture	F-1	240	Machine Drawing	B-10	30
Textile Design	D-2	60	Steam Engineering	B-12	45
Power Weaving	D-9	30	Weaving Mechanism	B-5	30
Textile Chemistry and Dye- ing	C-9	30	Physics	B-11	30
			Industrial History	E-6	15

SECOND TERM

Cotton Yarn Manufacture	F-1	165	Machine Drawing	B-10	45
Textile Design	D-2	60	Strength of Materials	B-4	30
Power Weaving	D-9	67	Physics	B-11	45
Textile Chemistry and Dye- ing	C-9, 11	82	Industrial History	E-6	15

THIRD YEAR

FIRST TERM

Cotton Yarn Manufacture	F-1	172	Power Weaving	D-10	203
Knitting	F-2	30	Cotton Finishing	H-2	30
Textile Design, Cloth Con- struction	D-6, 7	30	Electricity	B-20	15
			Mill Engineering	B-17	30

SECOND TERM

Cotton Manufacture	F-1	181	Mill Engineering	B-17	45
Knitting	F-2	30	Power Weaving	D-10	60
Textile Design, Cloth Con- struction	D-6, 7	45	Cotton Finishing	H-2	67
Hydraulics	B-13	15	Thesis		

COURSE II-3.—WOOL MANUFACTURING

The course of Wool Manufacturing is arranged for those who contemplate a career in the manufacture of woolen or worsted fabrics and can devote but three years to the school work. It includes instruction in all of the varied processes employed in adapting the wool fibre to cloth, namely,—sorting, scouring, carding, combing, spinning, designing, weaving, dyeing and finishing. The work is carried on by lectures, recitations and practical work in the laboratories.

Following the first term of the first year, which is common to all courses, the student commences work in the Woolen and Worsted Laboratory, and through systematic steps becomes acquainted with the machines employed in the first steps of yarn manufacturing. At the same time lectures are given upon the many kinds of wool, variation in quality, grades, uses, etc., as influenced by the locality where grown. This is followed by practical work on the sorting table.

The second and third years cover spinning of woolen yarn and worsted yarn by the Bradford and French systems, also the manufacture of tops, including combing, gilling and back washing. Scouring and carbonizing are taken up in detail by lectures and by practical work.

The general chemistry of the first year is followed by textile chemistry and dyeing in the second year. This includes a short course in the Dyeing Laboratory.

Textile design, cloth analysis and construction are continued from the first year throughout the course, the work being applied especially to woolen and worsted goods. Weaving on power looms commences in the second year and continues through the third.

Lectures on finishing commence with the third year and are augmented by extensive practice with the machines in the Finishing Department.

Work in the Engineering Department extends throughout all three years and includes mechanical drawing, properties of saturated steam, electricity and hydraulics. The practical application of the principles studied in these subjects is brought out forcibly in the work on mill engineering, where mill design and construction are considered. A short course covering methods employed in the testing of fibres, yarns and cloths, together with laboratory work in the manipulation of certain physical apparatus, is given in the third year.

For detailed description of the subjects see page 109.

COURSE II-3.—WOOL MANUFACTURING

(For First Term see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise			Hours of Exercise	
Mechanism	B-3	45	Elementary Chemistry	C-1	75
Mechanical Drawing	B-8	75	Elementary German or	E-2	} 37
Mathematics	B-1	30	Elementary French	E-4	
Textile Design	D-1	83	Physical Culture	I-1	30
Wool Yarn Manufacture	F-1	105	English	E-1	30

SECOND YEAR

FIRST TERM

Woolen and Worsted Yarn Manufacture	G-1	240	Machine Drawing	B-10	30
Textile Design	D-3	60	Steam Engineering	B-12	45
Power Weaving	D-9	30	Weaving Mechanism	B-5	30
Textile Chemistry and Dyeing	C-9	30	Physics	B-11	30
			Industrial History	E-6	15

SECOND TERM

Woolen and Worsted Yarn Manufacture	G-1	165	Machine Drawing	B-10	45
Textile Design	D-3	60	Strength of Materials	B-4	30
Power Weaving	D-9	67	Physics	B-11	45
Textile Chemistry and Dyeing	C-9, II	82	Industrial History	E-6	15

THIRD YEAR

FIRST TERM

Woolen and Worsted Yarn Manufacture	G-1	128	Power Weaving	D-10	202
Knitting	F-2	30	Woolen and Worsted Finishing	H-1	75
Textile Design, Cloth Construction	D-6, 7	30	Electricity	B-20	15
			Mill Engineering	B-17	30

SECOND TERM

Woolen and Worsted Yarn Manufacture	G-1	165	Mill Engineering	B-17	45
Knitting	F-2	30	Power Weaving	D-10	135
Textile Design, Cloth Construction	D-6, 7	45	Woolen and Worsted Finishing	H-1	75
Hydraulics	B-13	15	Thesis		

COURSE III-3.—TEXTILE DESIGN (General Textile Course)

The general course in Textile Design is planned to meet the demand of young men for a technical training in the general processes of textile manufacturing, but with particular reference to the design and construction of fabrics. To this end a foundation is laid in the first year by instruction in the elementary principles of designing, decorative art and weaving. That he may later in the course pursue to advantage instruction in yarn manufacturing, weaving, dyeing, finishing and some engineering problems, a foundation course in mechanics, mathematics and chemistry is laid. As the student is required to pursue courses in the yarn departments, both cotton and wool, he acquires a knowledge of the manufacture of cotton yarns from the bale to the yarn and of woolen and worsted yarns from the fleece through the varied processes of manufacturing woolen yarn or worsted yarn by both the French and Bradford Systems.

Throughout his entire course he receives instruction in design, cloth analysis and construction of all the standard cloths, viz.—trouserings, coatings, suitings, blankets, velvets, corduroys, plushes, etc. This is followed by advanced work in Jacquard designing and weaving which serves not only to acquaint the student with the many kinds of cotton, woolen, worsted, and silk fabrics of figured designs, but stimulates and develops any artistic talent he may possess. Decorative Art becomes an important part of the work of the second and third years.

The course in general inorganic and organic chemistry of the first year leads to the subjects of textile chemistry and dyeing in the second year. The instruction includes a short course in the dyeing laboratory.

Power weaving commences with the second year and continues throughout the course and work on all types of looms is required.

During the third year the student receives instruction in the finishing of cotton goods and woolen and worsted cloths. This instruction is given by means of lecture and laboratory work.

The engineering subjects given in the second and third years are intended to acquaint the student with such general knowledge as will be of assistance should he be called upon in later life to be a mill manager or should his subsequent progress lead to some executive position in the operation of a textile plant.

For detailed description of the subjects see page 109.

COURSE III-3.—TEXTILE DESIGN

(General Textile Course)

(For First Term see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise			Hours of Exercise	
Mechanism	B-3	45	Elementary Chemistry	C-1	75
Mechanical Drawing	B-8	75	Elementary German or	E-2	} 37
Mathematics	B-1	30	Elementary French	E-4	
Textile Design	D-1	128	Physical Culture	I-1	30
Cotton Yarn Manufacture	F-1	60	English	E-1	30

SECOND YEAR

FIRST TERM

Textile Design, Decorative		Machine Drawing	B-10	30
Art, Hand Loom Weaving		Steam Engineering	B-12	45
	D-2, 3, 4, 5	Weaving Mechanism	B-5	30
Cotton Yarn Manufacture	F-1	Physics	B-11	30
Power Weaving	D-9	Industrial History	E-6	15
Textile Chemistry and Dyeing	C-9			
				30

SECOND TERM

Textile Design, Decorative		Textile Chemistry and Dyeing	C-9, 11	67
Art, Hand Loom Weaving		Physics	B-11	45
	D-2, 3, 4, 5	Industrial History	E-6	15
Wool Yarn Manufacture	F-1			
Power Weaving	D-9			97

THIRD YEAR

FIRST TERM

Textile Design, Cloth Construction, Decorative Art		Power Weaving	D-10	120
		Woolen and Worsted Finishing	H-1	75
	D-6, 7, 8	Cotton Finishing	H-2	30
Woolen and Worsted Yarn Manufacture	G-1	Electricity	B-20	15
				112

SECOND TERM

Textile Design, Cloth Construction, Decorative Art		Power Weaving	D-10	128
		Woolen and Worsted Finishing	H-1	75
	D-6, 7, 8	Cotton Finishing	H-2	60
Woolen and Worsted Yarn Manufacture	G-1	Thesis		
				112

COURSE IV-3.—CHEMISTRY AND DYEING

The three year course in chemistry and dyeing is offered to those who are not able to devote four years for the course in chemistry and textile coloring. Many of the same subjects are given in the three year course that are included in the four year course, but it is not possible to cover these to the same extent in three years as in the longer course. The course, however, offers a very satisfactory preparation for those who intend to enter upon any branch of textile coloring, bleaching, or the manufacture or sale of the various dyestuffs and chemicals used in the textile industry. The theory and practice of all branches of dyeing, printing, bleaching, scouring, etc., are taught by lecture work supplemented with a large amount of laboratory work.

During the first year general chemistry, including both inorganic and organic, is taught by lectures and laboratory work, and this is supplemented during the second term by qualitative analysis and stoichiometry.

Advanced inorganic as well as advanced organic chemistry are studied throughout the second year as a continuation of the elementary chemistry of the first year, but the greater part of the time is spent upon quantitative analysis, industrial chemistry and textile chemistry and dyeing.

The third year is devoted to advanced textile chemistry and dyeing, dye testing, dye matching, woolen and worsted finishing, calico printing and cotton finishing, quantitative analysis, industrial chemistry, and physical chemistry.

The work is taken up in a thorough manner and has been so arranged that an equal amount of time is spent in the laboratories and in classroom work. Sufficient studies are taken in the other departments to broaden the knowledge of the student in regard to textile work in general, and he is given such training as the time will permit in mathematics, mechanical drawing, modern languages and designing.

The student who conscientiously performs all of the prescribed laboratory work and the practice work should be proficient not only in dyeing and textile printing, but should be well trained in the methods of analysis and the testing of the various chemicals, mordants and dyestuffs so extensively used in the textile industry.

For detailed description of the subjects see page 109.

COURSE IV-3.—CHEMISTRY AND DYEING

(For First Term see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mechanism	B-3 45	Elementary German or	E-2 } 45
Mechanical Drawing	B-8 30	Elementary French	E-4 }
Mathematics	B-1 30	Physical Culture	I-1 30
Cloth Analysis	D-1 30	Qualitative Analysis	C-2I 65
Elementary Chemistry	C-1 75	Stoichiometry	C-3 30
English	E-1 30		

SECOND YEAR

FIRST TERM

Advanced Inorganic Chemistry	C-4 45	Steam Engineering	B-12 45
Quantitative Analysis	C-6 150	Physics	B-11 30
Textile Chemistry and Dyeing	C-9, 10 68	Power Weaving	D-9 22
		Industrial History	E-6 15
		Advanced German	E-3 30

SECOND TERM

Industrial Laboratory	C-12 105	Physics	B-11 45
Advanced Inorganic Chemistry	C-4 45	Industrial History	E-6 15
Quantitative Analysis	C-6 150	Industrial Laboratory	C-12 67
Textile Chemistry and Dyeing	C-9, 10 158	Advanced German	E-3 30

THIRD YEAR

FIRST TERM

Quantitative Analysis	C-7 165	Advanced Textile Chemistry and Dyeing	C-14 225
Industrial Chemistry	C-13 30	Woolen and Worsted Finishing	H-1 30
Advanced Organic Chemistry	C-5 30		

SECOND TERM

Quantitative Analysis	C-7 149	Woolen and Worsted Finishing	H-1 68
Physical Chemistry	C-8 30	Thesis	C-19 113
Industrial Chemistry	C-13 30		
Advanced Textile Chemistry and Dyeing	C-14 120		

COURSE VI-3.—TEXTILE ENGINEERING

This course is planned to train as far as possible in three years the student to meet intelligently the engineering problems of the textile industry, as well as to provide him with the essentials of the processes and machines in the varied branches of this industry. Many of the subjects taken in this course are the same as given in I-4, page 93, but some can not be taken up in the limited time while others can be carried farther in the fourth year.

The student is first thoroughly grounded in the broad fundamental principles of science and mathematics underlying all engineering work and textile manufacturing with its many closely allied industries. The most important of the preliminary subjects are mathematics, physics, mechanics and mechanism, and mechanical drawing. The work in mechanism and drawing is particularly thorough and the practical uses of these subjects are considered of first importance. The study of physics while taking up the usual branches included in this subject also serves to a preparatory course for later instruction in Steam, Electricity and Hydraulics. The student is required to spend a portion of his time during the course upon the subjects of cotton yarns, woolen and worsted yarns, and power weaving with practical work in each branch. During his first year he has a brief course in the elements of design, and in his second year he pursues a course in textile chemistry and dyeing which is preceded in the first year by the necessary preliminary course in elementary organic and inorganic chemistry. Special importance is attached to the study of power generation, transmission, and measurement and courses with laboratory practice are given in the elements of steam, electrical and hydraulic engineering, to familiarize the student with the means, methods and results available in the modern practice of these branches.

The recently equipped engineering laboratory together with the extensive power plant of the school affords opportunities for a varied line of experimental work including boiler, engine, turbine, generator and pump tests. Systematic instruction in the most approved methods of machine shop practice is provided in a shop which is fully equipped with the best makes of modern tools. This feature of the course is considered a most valuable adjunct to the training of a textile engineer.

The work in mill engineering covers a wide range of subjects including mill construction with calculations and drawings, mill heating, lighting, fire protection, and electric driving. The arrangement of plants and machinery for the most economical power distribution and efficient organization is also taken up in detail, data for problems being taken from actual cases and the solution compared with those of some of our best known mill engineers.

For detailed description of the subjects see page 109.

COURSE VI-3.—TEXTILE ENGINEERING

(For First Term see page 91)

FIRST YEAR

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mechanism	B-3 45	Elementary German or	E-2 } 30
Mechanical Drawing	B-8 98	Elementary French	E-4 }
Mathematics	B-1 45	Physical Culture	I-1 30
Textile Design	D-1 60	Mechanical Laboratory	B-6 37
Elementary Chemistry	C-1 75	Cotton Yarns	F-1 60
English	E-1 30		

SECOND YEAR

FIRST TERM

Cotton Yarn Manufacture	F-1 75	Steam Engineering	B-12 45
Power Weaving	D-9 30	Weaving Mechanism	B-5 30
Textile Chemistry and Dye- ing	C-9 30	Machine Shop Practice	B-15 75
Mathematics	B-2 45	Engineering Laboratory	B-14 37
Machine Drawing	B-10 105	Physics	B-11 30
		Industrial History	E-6 15

SECOND TERM

Woolen and Worsted Yarn Manufacture	G-1 105	Machine Drawing	B-10 75
Power Weaving	D-9 30	Steam Engineering	B-12 52
Textile Chemistry and Dye- ing	C-9 15	Strength of Materials	B-4 30
Mathematics	B-2 45	Machine Shop Practice	B-15 60
		Physics	B-11 45
		Industrial History	E-6 15

THIRD YEAR

FIRST TERM

Woolen and Worsted Yarn Manufacture	G-1 120	Cotton Finishing	H-2 30
Power Weaving	D-10 45	Machine Shop Practice	B-15 60
Woolen and Worsted Finishing	H-1 67	Engineering Laboratory	B-14 37
Mill Engineering	B-17 68	Electricity	B-19 38
		Mathematics	B-2 45

SECOND TERM

Woolen and Worsted Yarn Manufacture	G-1 97	Power Plants	B-18 15
Woolen and Worsted Finishing	H-1 30	Electrical Engineering	B-19 90
Cotton Finishing	H-2 15	Hydraulics	B-13 15
Mill Engineering	B-17 90	Machine Shop Practice	B-15 60
		Engineering Laboratory	B-14 37
		Thesis	68

ENTRANCE REQUIREMENTS

The requirements for admission to this school are given in detail on page 69.

DIPLOMA COURSES—REQUIRED SUBJECTS

- A-1 Plane Geometry
- A-2 Algebra (I Elementary. II Advanced.)
- A-3 Elementary German B
or
- A-4 Elementary French B
- A-5 English
- A-6 History
- A-7 Arithmetic

DEGREE COURSES—REQUIRED SUBJECTS

- A-1 Plane Geometry
- A-2 Algebra (I Elementary. II Advanced.)
- A-3 Elementary German A
or
- A-4 Elementary French A
- A-5 English
- A-6 History

DEGREE COURSES—ELECTIVE SUBJECTS

- A-8 Physics
- A-9 Chemistry
- A-10 Solid Geometry
- A-11 Trigonometry
- A-12 Mechanical Drawing
- A-13 Mechanic Arts
- A-14 History
- A-15 Advanced German
or
- A-16 Advanced French
- A-17 English

Subjects of Instruction

TEXTILE ENGINEERING DEPARTMENT—B

Mathematics

(Algebra, Trigonometry, Elements of Analytical Geometry)—B-1

PREPARATION: A-1, A-2

This subject is given in the first year with the view of consolidating the separate branches of mathematics that have been given in previous years. The progress of the school has been such as to necessitate the introduction of Higher Algebra and Trigonometry, in the early part of the first term, and hence, as in other technical schools, it has resulted in a combined course. This course is presented by means of lectures, text-book, class and problem work, and consists essentially of the following: Progressions, Graphical Representation, Permutations and Combinations, Logarithms, Slide Rule, Trigonometry, Binomial Theorem, Partial and Continued Fractions, Series, Theory of Equations, Significant Figures, and Plotting of Scientific Data, Straight Line Equations, Point of Division of a Line, Equation of Parallel and Perpendicular Lines.

[ALL COURSES]

Mathematics

Analytical Geometry, Differential Calculus, Elements of Integral Calculus)—B-2

PREPARATION: B-1

This course is a continuation of the work of the first year, and treats of the following subjects: Formulae of Differentiation, Conic Sections, Transformation of Co-ordinates, Maxima and Minima, Direction of Curves, Center and Radius of Curvature, Problems on Differential Calculus, Elements of Integral Calculus, Integration as a Summation, and Plane Areas. The above are treated in both Rectangular and Polar Co-ordinates. Formulae of Integration, Integration by parts, Integration by Substitution, Successive Integration, Evaluation of Integrals, Center of Gravity, Center of Pressure, Total Pressure, Moment of Inertia.

[COURSES I-4, VI-3]

Mechanics and Mechanism—B-3

PREPARATION: A-1, A-2, B-1. TAKEN SIMULTANEOUSLY WITH B-1

These subjects are a necessary preparation for all courses and are taken in ninety hours of lectures and recitations covering the whole of the first year. The fundamental principles of these subjects are considered of the greatest importance and the application and problems are selected with special reference to their practical uses in textile machinery. The large variety of mechanism applications met in textile machines makes this course an essential one as a proper preparation for the student's later work in spinning and weaving. Some of the subjects treated in this course are:

MECHANICS

Work, power and energy.
Principle of moments.
Simple and compound levers.
Differential and common pulleys.
Jack screw and worm and wheel.
Parallelogram and triangle of forces.
Inclined plane and wedge.

MECHANISM

Linear and angular velocity.
Belting calculations.
Gears and gear trains.
Cam and cone pulley design.
Linkage problems.
Intermittent motions.
Differential and epicyclic trains.

[ALL COURSES]

Strength of Materials—B-4

PREPARATION: B-1 AND B-3

The work in this course is presented by lectures and recitations. First are considered mathematical and graphical conditions for equilibrium for any system of forces and the subjects of center of gravity and funicular polygons are introduced. Then follow problems on bridge and roof trusses under various conditions of dead, live, wind and snow loading. Masonry arches are finally considered. The course also includes a study of moment of inertia, dynamics and strength of materials.

[COURSES I-4, VI-3]

Weaving Mechanism—B-5

PREPARATION: TAKEN SIMULTANEOUSLY WITH D-9

This course consists of thirty lectures given during the first term of the second year and is required by all the regular students taking power weaving. A thorough analysis of all the important motions of power weaving is undertaken and the treatment is by graphical and analytical methods. The object of this course is to so familiarize the student with the theory of the mechanism of the loom that the time spent in the weave room on loom fixing will be used to the best advantage.

[COURSES I-4, I-3, II-3, III-3 AND VI-3]

Mechanical Laboratory—B-6

PREPARATION: B-3. TAKEN SIMULTANEOUSLY WITH B-4

This work is given during the second term of the first year and is supplementary to the course in Mechanism. Especial importance is attached to the demonstration of the fundamental principles of these subjects. Some of the experiments and tests made in this course are as follows:

Determination of coefficient of friction.

Proof of principle of moments.

Proof of principle of work.

Efficiency test of various hoisting and lifting appliances, such as tackle and fall, worm block, differential and triplex blocks, jack screws, wedges, etc.

Experimental proofs of the principles of graphic statics.

Efficiency tests on belt transmission including measurement of belt tensions, coefficient of friction, slip, etc.

Tests on various types of absorption dynamometers.

Calibration of transmission dynamometer.

Power measurements on textile machinery with differential dynamometer.

Measurement of friction of steam engine.

[COURSES I-4, VI-3]

Mechanical Drawing—B-7

PREPARATION: A-1. TAKEN SIMULTANEOUSLY WITH B-3

This course is taken during the first year, and consists of work in the drawing room supplemented by lectures. This subject is considered of the greatest importance as a preparation for the student's future work and the practical usefulness of drawing of this character is fully emphasized. The course is systematically laid out covering in order the following divisions:

Care and use of drawing instruments.

Geometrical constructions.

Elements of projections and descriptive geometry.

Isometric projection.

Developments with practical applications.

Sketching practice on machine details.

[ALL COURSES]

Machine Drawing—B-8

PREPARATION: B-7

This work is the continuation of the mechanical drawing and is pursued throughout the second term of first year. This work is wholly of a practical character and includes sketching from textile machinery details, working scale detail and assembly drawing, tracing and blue printing. The rudiments of machine design to supplement the work in strength of materials is also given.

[COURSES I-4, I-3, II-3, III-3, VI-3]

Machine Drawing—B-9

PREPARATION: B-7

For students electing IV-2 or II-4 in the second term of the first year a course of machine drawing is given similar to B-8 except that it is not as extensive and is concluded in thirty hours.

Machine Drawing—B-10

PREPARATION: B-3, B-7, B-8

During the second year a period of two hours per week is devoted to advanced graphical mechanism problems. The data for all of these problems is in every case taken directly from some of the textile machines that the students meet in other departments. These problems include cam designs for builder motions, mule scroll layouts, Scaife builder motion analysis, fly frame cone design, mule quadrant motion, analysis of camless winder and a number of others of similar character.

[COURSES I-3, II-3, III-3, I-4]

Physics—B-11

PREPARATION: B-1

This course is given during the second year and serves especially as a preparation for Steam Engineering, Hydraulics, Electricity and Optics. The subject is presented by means of lectures, recitations, problems, and reference books. The lectures deal chiefly with the application of the various physical laws and principles with the view of their adaption to the above subjects, while the reference books are used to supplement the lectures. The subjects taken up are essentially as follows: Gravitation, Moving Bodies, Mechanics, Elasticity, Hydrostatics, Elements of Hydraulics, Properties of Fluids and Gases, and the Theory of Sound. These subjects are followed by a series of lectures on heat phenomena dealing with the Generation of Heat, Thermometry, Calorimetry, Transfer of Heat, its Effect on Solids, Liquids, and Gases, and problems such as lead to the Elements of Steam Engineering.

The latter part of the course is devoted to the discussion of the laws governing the Nature, Propagation and Transmission of Light waves, special stress being laid on interference, reflection and refraction, mirrors, lenses, microscope, spectroscopy and photometer. Particular attention is given to the color effects produced by the combination of different colors in connection with Maxwell's Color Diagram and the Young Helmholtz Theory of Color Sensation. During the last part of the course the principles of Electricity and Magnetism are taken up in detail.

[ALL COURSES]

Steam Engineering—B-12

PREPARATION: B-II

The purpose of this work is to familiarize the student with the essentials of power generation and the means and methods of modern practice in steam engineering.

The different types of boilers, engines, pumps, condensers, turbines, and other important features of a steam plant are first considered with reference to their construction and general arrangement. The remainder of the course is devoted to a thorough study of these elements of a power plant from the standpoint of the heat phenomena upon which their operation and efficient performance depend. Practice with the steam engine indicator is included in this work, and also engine and boiler testing.

[ALL COURSES]

Hydraulics—B-13

PREPARATION: B-3, B-II

This subject is presented by means of lectures covering the principles of hydraulics, including hydrostatics, measurements of flow of water through orifices, pipes, nozzles and over weirs. The different types of turbines are studied with results of tests and rating tables.

[COURSES I-4, VI-3, I-3, II-3]

Engineering Laboratory—B-14

PREPARATION: B-12

The principles underlying the subjects of Steam Engineering, Hydraulics and Thermodynamics are demonstrated in a practical manner in the work in the Engineering Laboratory. Greater importance is attached to the development of initiative and responsibility in the student than the mere accomplishment of a large number of carefully planned tests. The character of this work is indicated by the following list of experiments and tests:

Calibration of gages, thermometers, indicators, anemometers, tachometers, and other measuring instruments.

Experiments on flow of steam.

Calorimeter tests.

Radiation tests and pipe covering tests.

Injector and ejector tests.

Engine tests. Condensing and non-condensing.

Steam pump tests.

Surface condenser tests.

Valve setting.

Boiler testing.

Tests on heating and ventilating fans, both motor and engine driven.
Pump tests. Triplex and centrifugal.
Air compressor tests.
Flue gas analysis.
Steam turbine tests. Condensing, non-condensing and low pressure.
Complete steam plant testing.
Gas engine testing.

[COURSES I-4, VI-3]

Machine Shop Practice—B-15

PREPARATION: B-3

Systematic instruction is given in the most approved methods of machine shop practice, the object being to familiarize the student with the proper use of hand and machine tools and the characteristics of the different materials worked. Arrangements have been made with a local machine company of such a character as to give the work the greatest educational value and the important commercial element which stimulates the student's interest. Particular attention is given to the form, setting, grinding and tempering of tools and the mechanism of the different machines involving certain speeds, feeds, etc. The course is so planned that the instruction in each typical operation shall conform as nearly as possible to commercial machine shop practice on textile machinery. The list of tools which appears under Equipment in this bulletin gives an idea of the scope of the work which includes chipping and filing, tool grinding and tempering, straight and taper turning, screw cutting, drilling and boring, planer work; milling machine work, including gear cutting. Instruction is also given in the use of wood working tools, both hand and machine and in forging.

[COURSES I-4, VI-3]

Mill Engineering—B-17

PREPARATION: B-3, B-4, B-10

This work covers a wide range of subjects and is of the most practical character possible. All of the student's previous work in engineering and his knowledge of the textile processes are here brought together in the consideration of the larger problems of mill design, construction and organization. A detailed study is made of the most modern types of mill buildings including all calculations and drawings. Practice is also given with the engineer's transit and level in plane surveying, setting batters, lining and leveling shafting.

The modern methods of power transmission and the proper arrangement of textile machinery are also given careful consideration. The problems are in every case taken from actual conditions from mills already built or in process of construction. The questions of mill heating, ventilation, lighting, humidification and fire protection are also studied and the time spent in the drawing-room enables the student to work out nearly all of the more important problems involved in the design of an entire textile mill plant. The close relation existing between proper plant design and economical production is also considered.

[COURSE I-4]

Power Plants—B-18

PREPARATION: B-13

This course, which consists of lectures given in the second term of the third year, takes up the fundamental considerations involved in the planning of a power plant for a textile mill. A standard text book is used in connection with the lectures and the problems are taken largely from plans of existing modern plants. The choice of type and size of units for certain conditions are given particular attention.

[COURSES I-4, VI-3]

Electrical Engineering—B-19

PREPARATION: B-II

The elementary principles of Electricity and Magnetism are considered in a lecture course. The development and application are shown by detailed study of the means used to generate, transmit, and transform electrical energy to meet the requirements of textile machinery and plants. This involves the theory of Direct and Alternating Current Generators, Motors, Instruments, as well as the various phenomena associated with them.

The laboratory course includes a study of instruments and methods employed in general electrical power testing. Attention is given to various lighting units, their particular properties and relative values in meeting the special problems of illumination in textile mills.

[COURSES I-4, VI-3]

Efficiency Engineering—B-20

In recognition of the great advances which have been recently made towards better methods of management and of the possibilities which may result from its application to the textile industry, a course in efficiency engineering has been established to enable the students to understand and

apply the principles and details of modern scientific management. The instruction in this course begins with a consideration of the factory location and design and their effect on efficiency of production, after which the proper form of organization for manufacturing establishments is discussed in detail, together with organization charts and records. This is followed by a study of the details of the work of the various departments, especially the planning department, during which the subjects of time study, planning, routing, special slide rules and instruments, store systems and perpetual inventories, mnemonic symbolizing, orders and returns, graphical reports, etc. are all gone into very carefully.

The course includes a thorough study of the various wage systems in common use and the relations of psychology to efficient management is also considered. Finally, visits to shops where modern methods of management have been installed enables the student to see the practical working out of the ideas developed in the lectures.

Accounting.

The purpose of the course in accounting is two fold. In the first place it aims to acquaint the student with the modern methods of handling the financial end of a mercantile and manufacturing business, and at the same time gives him a much-needed knowledge of certain common elementary business transactions, such for instance, as the use of checks, drafts and notes, bank discounts, etc. In the second place it gives him an intelligent comprehension of the requirements and the design of a proper cost accounting system.

Whereas it is not the purpose of the course to make the student a proficient bookkeeper or accountant, the nature of the work necessitates a knowledge of double-entry bookkeeping and of the functions of ledger accounts, which is developed by lectures and by practice work. It is coupled with instruction on the compilation of Balance Sheets in proper form, together with Profit and Loss statements and supporting schedules. Thus a student is able to see the exact effect of each item of expense or income on the net profits of the business, or on its assets and liabilities, and can better judge of their relative importance. Accounting methods of handling charges incident to a manufacturing business are considered in lectures and elaborated by actual practice.

Cost Accounting forms an important part of this subject and gives a knowledge of the various methods of distributing the proper proportion of wages, overhead expenses, etc. in ascertaining the cost of the finished product.

Business Law

Under this subject are given lectures, supplemented by the use of suitable texts, on the law governing Contracts, Negotiable Instruments, Sales, Bills of Lading and Real Estate.

CHEMISTRY AND DYEING DEPARTMENT—C

Elementary Chemistry (Inorganic and Organic Chemistry)—C-1

Instruction in Elementary Chemistry extends through the first year and includes lectures, recitations, and a large amount of individual laboratory work upon the following subjects:

Chemical Philosophy

Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, salts, Avogadro's law, molecular weights, formulas, valence, periodic law, etc.

Non-Metallic Elements

Study of their occurrence, properties, preparation, chemical compounds, etc.

Metallic Elements

Study of their occurrence, properties, metallurgy, chemical compounds, etc.

The students take up as thoroughly as the time will permit the qualitative detection of the more common metals and non-metals, with practical work.

The Hydrocarbons and their Derivatives

Study of their occurrence, properties, preparations and uses. This work although elementary in character is of sufficient breadth to prepare the student understandingly for the work with the artificial dyestuffs which follows.

[ALL COURSES]

Qualitative Analysis—C-2

PREPARATION: C-1 TAKEN SIMULTANEOUSLY

Qualitative Analysis is studied during the second term of the first year. The work consists of lectures, recitations, and laboratory work. The student must become familiar with the separations and the detections of the common metals and acids by the analysis of a satisfactory number of solutions, salts, alloys, and pigments. At intervals during the term, short laboratory tests are given as well as the regular written examinations.

No pains are spared to make the course as valuable to the student as possible and to encourage only thorough and intelligent work.

When sufficiently advanced, students take up the examination of various products with which the textile chemist must be familiar, such as testing mordanted cloths, pigments, and the various dyeing reagents.

During the latter part of this course a certain amount of time is devoted to the preliminary operations of Quantitative Analysis, such as the precipitation and washing of such substances as barium sulphate, magnesium ammonium phosphate and calcium oxalate, although no weighings or actual determinations are made.

A student's marks in this subject depend as much upon the neatness and care used in manipulation as upon the actual results obtained.

[COURSES II-4, IV-3]

Stoichiometry—C-3

PREPARATION: B-1

This subject is taken during the second half of the first year. The application of the metric system is thoroughly studied, and problems are worked involving the expansion and contraction of gases, determination of empirical formulae, combining volume of gases and quantitative analysis.

[COURSES II-4, IV-3]

Advanced Inorganic Chemistry—C-4

PREPARATION: C-1

The whole subject of Inorganic Chemistry is reviewed during the second year, and many advanced topics are introduced which were necessarily omitted from the first year course in General Chemistry.

[COURSES II-4, IV-3]

Advanced Organic Chemistry—C-5

PREPARATION: C-1

In this course which consists of lectures and recitations, the principles of organic substitution and synthesis are thoroughly discussed, and as many illustrations are used as the time will permit, particularly such as are applied in the arts. The aliphatic series of hydrocarbons and their derivatives are studied for about twenty weeks, the remainder of the time being devoted to the benzene series. The aim of the course is to lay a broad foundation for the study of the Chemistry of the artificial dyestuffs. Students are required to work out problems in the synthesis of various compounds in order to become familiarized with equation writing.

[COURSES II-4, IV-3]

Quantitative Analysis—C-6

PREPARATION: C-2, C-3

During the second year, the principles of analytical work are thoroughly taught, the work being based on Talbot's Quantitative Chemical Analysis. Gravimetric analysis is studied during the first term, and volumetric analysis during the second term. The samples analyzed include salts, ores, minerals, bleaching powder and alkalis. Frequent recitations are held for the discussion of methods and the solution of stoichiometrical problems. Students are encouraged to read the standard works and magazines on chemical subjects, in order to cultivate broad views of the science.

[COURSES II-4, IV-3]

Quantitative Analysis—C-7

PREPARATION: C-6

This course consists chiefly of technical analysis, the principal consideration being the analysis of water, alum, ammonia, soaps, coal, indigo, tannin, and the ultimate analysis of organic compounds, as well as the examination of acids, alkalies, oils, scouring materials and such substances as starches, gums, and other thickeners, and the detection of adulterants.

No pains are spared to give the student the benefits of all the latest researches along the lines of industrial analytical methods, and original work is encouraged in all.

[COURSES II-4, IV-3]

Physical Chemistry—C-8

PREPARATION: C-4, C-5, B-11

This subject is studied during the third and fourth years. It includes the principles of calorimetry, specific heat, vapor density, the various methods of determining molecular weights, laws of solutions, electrolytic dissociation, theories of precipitation, thermo-chemistry, surface tension, etc. The student is required to work out a large number of problems introduced by the subject.

[COURSES II-4, IV-3]

Textile Chemistry and Dyeing—C-9

PREPARATION: C-1, B-3, B-7

The outline of the lecture course which is given through the second year is as follows:

Technology of Vegetable Fibres

Cotton, Linen, Jute, Hemps, China Grass. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies and heat.

Technology of Animal Fibres

Wool, Mohair, Silk. Chemical and physical properties, chemical compositions, microscopical study, and their action with chemicals, acids, alkalies and heat.

Technology of Artificial Fibres

Study of the various forms of artificial silk, the process of manufacture, their properties and action with chemicals, acids and heat.

Operations Preliminary to Dyeing

Bleaching of cotton and linen, wool scouring, bleaching, fulling and felting of wool, carbonizing, silk scouring and bleaching, action of soap.

The bleaching of cotton cloth, yarn and raw stock is studied at length with detailed descriptions of the various forms of kiers and machinery used; also the action of the chemicals used upon the material and the various precautions that must be taken in order to insure successful work.

Under this heading is also included an exhaustive study of the reagents used in emulsive wool scouring process and their action upon the fibre under various conditions; also the most successful of the solvent methods for degreasing wool.

Water and its Application in the Textile Industry

Impurities present, methods for detection, their effect during the different operations of bleaching, scouring, dyeing and printing, and the methods for their removal or correction.

The important subject of boiler waters is also studied under this heading with a full discussion of the formation of boiler scale, its disastrous results and the methods by which it may be prevented.

Mordants and Other Chemical Compounds used in Textile Coloring not Classified as Dyestuffs

Theory of mordants, their chemical properties and the application, aluminum mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannin materials, soluble oil, fixing agents, levelling agents, assistants, and numerous other compounds, not dyestuffs, that are extensively used in the textile industry.

Under the heading are included the definitions of various terms and classes of compounds used by textile colorists, such as color lakes, pigments, fixing agents, developing agents, mordanting assistants, mordanting principles and levelling agents.

Theory of Dyeing

A discussion of the chemical, mechanical, solution and absorption theories, and the various views that have been advanced by different investigators of the chemistry and physics of textile coloring processes.

Under this heading are discussed the general methods of classifying dyestuffs and definitions of such terms as textile coloring, dyeing, textile printing, substantive and adjective dyestuffs, monogenetic and polygenetic dyestuffs.

Natural Organic Coloring Matters

Properties and application of indigo, logwood, catechu or cutch, Brazil wood, cochineal, fustic, tumeric, madder, quercitron bark, Persian berries, and other natural dyestuffs that have been used within recent years by textile colorists.

Mineral Coloring Matters

Under this heading are discussed the properties of such inorganic coloring matters and pigments as chrome yellow, orange and green, Prussian blue, manganese brown, and iron buff.

Artificial Coloring Matters

General discussion of their history, nature, source, methods of manufacture, methods of classification, and their application to all fibres.

Special study of:—

Basic Coloring Matters.

Phthalic Anhydride Colors, including the eosins and phloxines.

Acid Dyestuffs.

Janus Colors.

Direct Cotton Colors.

Sulphur Colors.

Mordant Colors, including the alizarines and other artificial coloring matters requiring metallic mordants.

Mordant Acid Colors.

Insoluble Azo Colors, developed on the fibre.

Reduction Vat Colors, including Artificial Indigo and its derivatives, the Indanthrenes, Helindone, Ciba and Algol Colors.

Aniline Black and other artificial dyestuffs not coming under the above heads.

As each class of dyestuffs is taken up, the details of the methods of applying them upon all the different classes of fabrics and in all the different forms of dyeing machines are thoroughly discussed; also the difficulties which may arise in their application, and the methods adopted for overcoming them.

Machinery used in Dyeing

A certain amount of time is devoted to the description of the machinery used in the various processes of textile coloring, which is supplemented as far as possible by the use of charts, diagrams, and lantern slides.

Most of the important types of dyeing machines are installed within the dyehouse of the School and the students can be taken directly from the lecture room and shown the machines in actual operation.

[ALL COURSES]

Dyeing Laboratory—C-10

PREPARATION: C-9 TAKEN SIMULTANEOUSLY

Besides lectures and recitations upon the subject of Textile Chemistry and Dyeing practical laboratory work is required. By the performance of careful and systematic experiments the student learns the nature of the various dyestuffs and mordants, their coloring properties, their action under various circumstances and the conditions under which they give the best results. The more representative dyestuffs of each class are applied to cotton, wool and silk, and each student is obliged to enter in an especially arranged sample book, a specimen of each of his dye trials with full particulars as to the conditions of experiment, percentage of compounds used, time, temperature of dye bath, etc.

For convenience and economy most of the dye trials are made upon small skeins or swatches of the required material, but from time to time students are required to dye larger quantities, in the full sized dyeing machines which are described elsewhere.

By the use of a small printing machine the principles of calico printing are illustrated, and by means of the full sized dyeing machines and vats, the practical side of the subject is studied. It is the constant endeavor of those in charge, to impart information of a theoretical and scientific character that will be of value in the operation of a dyehouse.

[COURSES II-4, IV-3]

Dyeing Laboratory—C-11

PREPARATIONS C-9. TAKEN SIMULTANEOUSLY

This course in general laboratory work in Textile Chemistry and Dyeing is given during the second term of the second year. It is so arranged as to acquaint the student with the properties of the fibres, mordants and coloring matters, and their application in the Textile Industry.

[COURSES I-3, II-3, III-3]

Industrial Chemistry Laboratory—C-12

PREPARATION: C-I

Special attention has been given to this subject because it is considered extremely important in the study of chemistry in general, and of textile chemistry in particular. During the second year considerable time is spent in the laboratory in the actual manufacture, from raw materials, of the chemical compounds used in textile work. Each student is required to make careful record of all of the crude materials used, as starting points, and to carry the various processes through carefully

with the view of producing as great and pure a yield of each substance as possible. Industrial Chemistry not only involves the application of the principles of both inorganic and organic chemistry, but of analytical work as well, for the purity of the compounds produced must be tested after their manufacture.

In addition to the general work in this subject, each student is required to make a special study of the manufacture of some chemical from raw materials in considerable quantity (20 to 25 pounds) making a complete quantitative analysis of all raw materials used and of the finished product, accounting for everything throughout the process with the object of producing as near the theoretical yield as possible. The student is charged with the amount of raw material at market prices, and the finished product is bought back by the school.

Recently much new apparatus has been added to the industrial chemistry laboratory, and it is now believed to be one of the most complete of its kind. The present equipment allows a comparatively large quantity of material to be handled at one time.

[COURSES II-4, IV-3]

Industrial Chemistry

Lecture—C-13

PREPARATION: C-4, C-5, C-12

During the whole of the third year, lectures and recitations are held in Industrial Chemistry, the course in general following "Thorpe's Outline of Industrial Chemistry." Particular attention is paid to those subjects which are of special interest to the textile chemist, as oils, soaps, gas and coal tar industry, building materials, and the manufacture on a large scale of important chemical compounds, such as the common acids and alkalies, bleaching powder, various mordants, etc. The course is illustrated as far as possible with specimens, diagrams and charts, and the students are given an opportunity to visit some of the industrial establishments in the vicinity of Lowell and Boston.

[COURSES II-4, IV-3]

Advanced Textile Chemistry and Dyeing—C-14

PREPARATION: C-9, C-10

This is a continuation of the Textile Chemistry and Dyeing of the second year and includes a review of the second year's work in this subject, with the introduction of many advanced considerations, and in addition the following subjects:—

Classification and Construction of Artificial Dyestuffs

A study from a more advanced standpoint of the classification and constitution of artificial dyestuffs, including the various methods used in their production, also the orientation of the various groups which are characteristic of these compounds, and their effect on the tinctorial power of dyestuffs.

The object of this study is to give the student a more complete knowledge of the artificial dyestuffs from the color manufacturer's point of view, which will prove of particular value to those who intend later to enter the employ of dyestuff manufacturers or dealers.

Color Matching and Color Combining

A study of that portion of physics which deals with color, and the many color phenomena of interest to the textile colorist, and lecture work being supplemented with the practical application of the spectroscope and tintometer, and much practice in the matching of dyed samples of textile material.

The primary colors both of the scientist and textile colorist and the results of combining colored lights and pigments, and such subjects as color perception, color contrast, purity of color, luminosity, hue, color blindness, dichroism, fluorescence, and the effect of different kinds upon dyed fabrics are discussed under this heading.

Each student's eyes are tested for color blindness early in the course in order that he may be given an opportunity to change his course if his eyes should prove defective enough to interfere with his work as a textile colorist.

A dark room has been provided where various experiments in color-work and color matching may be performed.

Dye Testing

This subject includes the testing of several dyestuffs of each class, to all the common color destroying agencies, the determination of their characteristic properties and their action towards the different fibres, also the determination of the actual money value and coloring power of dyestuffs in terms of a known standard.

Each student is required to make a record of each color tested upon an especially prepared card which furnishes a permanent record of all dyestuffs, their dyeing properties, fastness to light and weather, washing, soaping, fulling, perspiration, bleaching, steaming, ironing, rubbing, acids and alkalies.

Union Dyeing

A study of the principles involved in the dyeing of cotton and wool, cotton and silk, and silk and wool union materials with the production of solid and two color effects.

Textile Printing

A thorough study of the whole subject of textile printing, each student being required to individually produce no less than twenty different prints including the following styles:—Pigment style, direct printing style, steam style with tanning mordant, steam style

with metallic mordant, madder or dyed style, the ingrain or developed azo style, discharge dye style, discharge mordanted style, resist style, indigo printing, aniline black printing.

The different parts of the calico printing machine are thoroughly studied, also the precautions which must be considered in its use and the arrangement of the dyeing apparatus which must accompany such a machine.

Special attention is paid to the methods of mixing and preparing the various color printing pastes that are used in the above work upon the manufacturing scale as well as experimentally in the laboratory.

Cotton Finishing

A study of the various processes of finishing cotton cloth and the different materials used therein. The work involves the discussion of the various objects of cotton finishing and such operations as pasting, damping, calendering, stretching, stiffening, mercerizing, beetling, and filling, and the various machines used for carrying out these processes.

Mill Visits

During the third and fourth years, visits are made to some of the large dyehouses, bleacheries and printworks in the vicinity.

[COURSES II-4, IV-3]

Organic Chemistry Laboratory—C-15

This course includes the usual methods of organic analysis and the preparation of a large number of compounds, particularly those used in the manufacture of dyestuffs. From these each student prepares many of the more important dyes. The student gains not only knowledge of the dyes and their synthesis but a thorough familiarity with the methods of organic work. Sufficient class work is introduced to impress on his mind the chemical facts on which his work depends.

[COURSE II-4]

Engineering Chemistry—C-16

PREPARATION: C-4, C-5, C-6

A series of lectures is given upon the general subject of Engineering Chemistry, which include particularly the consideration of fuels, oils, and water from the chemical engineer's standpoint. The elements of Chemical Engineering are also considered to such an extent as time will permit.

[COURSES II-4, IV-3]

Industrial Analysis—C-17

PREPARATION: C-6

In conjunction with the lectures in Engineering Chemistry there is required a specified amount of laboratory work in the Industrial Analysis Laboratory which has been recently thoroughly equipped with the latest and best apparatus for fuel and oil analysis.

[COURSES II-4, IV-3]

Microscopy and Photomicrography—C-18

The value of the microscope in the detection and examination of the various fibres cannot be overestimated, and often facts may be discovered, and conclusions drawn, which could be arrived at in no other way.

The students in this course are given as much work with the microscope as time will permit. They receive instruction in the use of the high grade microscopes, and not only have practice in the examination and detection of the fibres, but are required to become proficient in the preparation of permanent slides.

Opportunity is also given for students to take photomicrographs of fibres and the various slides which they may prepare. A special dark room has been provided for this purpose.

[COURSES II-4, IV-3]

Thesis—C-19

Before graduation the student must present a thesis which shall consist of a report of some original investigation or research that he has conducted while at the school.

A relatively large number of hours are specially set aside for this work, and students are encouraged to select some object for their investigation which shall be of practical as well as theoretical interest.

[COURSE II-4]

Advanced Organic Chemistry (Dyestuffs)—C-20

This course consists of an advanced study of the coal-tar coloring matters, their chemistry, relations of their composition to their coloring power, and the chemistry of their preparation.

[COURSES II-4]

Technical German—C-21

This course consists of the reading of German technical journals with the object of familiarizing the student with the current German publications in Textile Chemistry and Coloring.

[COURSE II-4]

TEXTILE DESIGN AND WEAVING DEPARTMENT—D

Textile Design—D-1

During the first year instruction is given in the subject of classification of fabrics, use of point or design paper, plain fabrics, intersection, twills and their derivation, sateen, basket and rib weaves, checks and stripes, fancy weaves including figured and colored effects; producing chain and draw from design and vice versa; extending and extracting weaves.

[FIRST TERM—ALL COURSES]

[SECOND TERM—COURSES I-4, I-3, II-3, III-3, VI-3]

Decorative Art—D-1

The instruction in this subject is given in connection with Textile Design, and is conducted entirely by class work. During the first term Freehand Drawing is taught by means of plates and models, and practice in coloring is given in conjunction with this work.

Practice in lettering, spacing and general arrangement of designs and sketches is given. The Engineering alphabet is used in all work.

During the second term instruction is given in drawing, sketching, coloring and designing with reference to their application in textiles. Good examples of applied design in textiles as well as in other branches are used as a basis for modified designs selected and composed by the student. This stimulates originality as well as teaches the student to appreciate good designs and color.

Cloth Analysis—D-1

In the first year this subject takes up in a systematic manner the analysis of samples illustrating the various cloth constructions for the purpose of determining the design of the weave, the amount and kind of yarns used and forms the basis of calculation in the cost of reproducing any style of goods. The various topics discussed are: reeds and setts; relation and determination of counts of cotton, woolen, worsted, silk, and yarns made from the great variety of vegetable fibres; grading of yarns, folded, ply, novelty and fancy yarns; application of the metric system to yarn calculation; problems involving take-up, average counts, determination of counts of yarn, weight of yarn required to produce a given fabric.

[FIRST YEAR—ALL COURSES]

Hand Loom Weaving—D-1

During the first year the work in hand loom weaving is taken in connection with design and analysis and consists largely of picking-out patterns and reproducing them in the loom. Instruction is also given in hand dressing, combing, beaming, drawing-in and building harness chains for dobby work.

[FIRST TERM—ALL COURSES]

[SECOND TERM—COURSES I-3, II-3, III-3]

Textile Design—D-2

FOR COTTON GOODS—PREPARATION: D-1

The work of the second year follows with consideration of fancy and reverse twills, diaper work, damasks, skip weaves, sateen fabrics with plain ground, backed fabrics, and multiple ply fabrics. Students are required to make original designs and put the same into the loom. Special attention is given to the consideration of color effects.

The analysis of these fabrics forms a part of the course in design. This also includes the necessary calculations required to reproduce the fabric or to construct fabrics of similar character.

[COURSES I-4, I-3, III-3]

Textile Design—D-3

FOR WOOLEN AND WORSTED GOODS

PREPARATION: D-1

During the second year the instruction given includes warp and filling backed cloth, figured effects produced by extra warp and filling, double cloths, multiple ply fabrics, cotton warps, blankets, bath-robcs, crepes, filling reversibles, Bedford cords, imitation furs, crepons, matelasse and imitations, double plain, ingrains, velvets, corduroys, overcoatings, trouserings.

The analysis of these fabrics together with the consideration of the shrinkages, and dead loss in all fabrics, theory of diameter of yarns, costs of mixer and blends, is a part of this course.

[COURSES I-4, II-3, III-3]

Decorative Art—D-4

PREPARATION: D-1

The work of the second year is similar to that of the previous year, but is more advanced and specific. More original work is required as well as copying and composition work.

[COURSE III-3]

Hand Loom Weaving—D-5

PREPARATION: D-1

In the second year, blanket, Jacquard and leno work are covered, and experiments are made with different weaves and fabrics.

[COURSE III-3]

Textile Design—D-6

PREPARATION: D-2 OR D-3

The advanced work takes up the more complicated weaves adapted to harness work and leads into leno and Jacquard designs. The following is a brief list of the subject heads which will give some idea of the course:

Double plain cloths, ingrains, tricots, chinchilla, tapestry, blankets, upholsteries, spot weaves, pile or plush, crepon, matelasse and its imitation, pique, Marseilles, quilting, miscellaneous designs for Jacquard, lenos, fustian, tissue fabrics and lappets.

The same plan is pursued during this year as in the second year; that of requiring the student to make original designs and to weave the same.

[COURSES I-4, I-3, II-3, III-3]

Cloth Construction—D-7

PREPARATION: D-2 OR D-3

The work includes the application of the different weaves and their combinations in the production of fancy designs, both modified and original, the calculation involved in the reproduction of standard fabrics changed to meet varying conditions of weight, stock, counts of yarn and value, and the discussion of the breaking strengths of fabrics and relationship of the construction of the fabric to breaking strength.

Instruction in this subject which is given by class room work, is intended to bring together the principles considered under the subject of design, cloth construction, weaving and yarn making of previous years, and to show the bearing each has in the successful construction of a fabric.

[COURSES I-4, I-3, II-3, III-3]

Decorative Art—D-8

PREPARATION: D-4

Original designs and sketches for particular grades of goods and the study of color effects form the important part of the third year course. It should be understood that work in Decorative Art is carried on in conjunction with textile construction and weaving, particularly on the Jacquard loom. Designs of merit are carefully developed in detail and woven into cloth.

[COURSE III-3]

Decorative Art for Special Students

This course is planned to give a student a working knowledge and appreciation of design. The first and second years are devoted to a general study of design, color, perspective, lettering and rendering. Drawings are made in the Historic styles for all materials—wood, gold, silver, copper, brass, leather, fabrics, wall papers, and glass.

In the third year students should specialize and devote their attention to the material in which they expect to work.

Power Weaving—D-9

PREPARATION: D-1. TAKEN SIMULTANEOUSLY WITH B-5

In connection with the work in Textile Design and Cloth Analysis practical work is carried on upon the power looms. This includes the preparation of warps, beaming, dressing, sizing, drawing-in and making of chains, the cutting and lacing of cards, spooling and quilling and the machinery for the same. A study is made of warpers and sizing machines both for cotton and woolen. Lectures are given to correspond with the progress of the student in the Power Weaving Laboratory covering the following subjects:

Loom adjustments, chain building, shuttle changing looms, dobby looms, single and double acting dobbies, handkerchief motions, leno weaving, centre selvedge motions, filling changing looms, oscillating reeds, lappet motions, various shaker motions, towel and other pile cloth weaving, Jacquard looms, single and double lift leno Jacquards, Jacquards of special design, tying up Jacquard harness. The consideration of the mechanical operation and design of the special mechanisms and the calculations involved are taken up by the Engineering Department in the course of weaving mechanism.

[COURSES I-4, I-3, II-3, III-3, VI-3]

Power Weaving—D-10

PREPARATION: D-9; D-2 OR D-3

Instruction is given in weaving on fancy woolen and worsted looms, single and double acting dobbies, leno weaving, various shaker motions, lappet loom weaving, double and single lift Jacquard looms, tying up Jacquard harness, leno Jacquard, harness and box chain building; warp preparation for woolen and worsted and cotton; formulas for making up different kinds of sizing. Lectures are given to correspond with the same.

[COURSES I-4, I-3, II-3, III-3, VI-3]

LANGUAGE AND HISTORY DEPARTMENT—E

English—E-1

PREPARATION: A-5

A technically trained man should be able to express himself clearly, forcibly and fluently, as inability to do so will be a serious handicap to him in after life. The object of the English course is to develop the student's power of expression by a thorough study of the principles of advanced rhetoric and composition and by constant writing of themes illustrative of the four forms of discourse, viz., description, narration, exposition, and argumentation. In addition to the study of rhetoric and composition and the writing of themes, several classics such as are not read in the preparatory schools are studied and discussed.

[ALL COURSES]

Elementary German—E-2

This course is intended for first year students who offer French as an entrance requirement. The work is elementary in character, and much time is devoted to the study of the rudiments of German grammar with practice in composition. During the latter part of the year considerable attention is given to the reading of ordinary German prose, which serves as an additional preparation to the student for the later reading of works along scientific and industrial lines.

Advanced German—E-3

PREPARATION: E-2

For students who are pursuing a degree course the elementary course of the first year is continued throughout the second year. The work consists of the study of some of the more advanced principles of grammar and especially of the reading of scientific German dealing with a variety of subjects, and the translation of commercial German.

[COURSES I-4, II-4]

Elementary French—E-4

This course is intended for first year students who offer German as an entrance requirement. The work is elementary in character, and much time is devoted to the study of grammar and composition. Facility in translation is acquired by a considerable amount of reading from general or scientific sources.

Advanced French—E-5

PREPARATION: E-4

For students who are pursuing a degree course the elementary course of the first year is continued throughout the second year, and the work is devoted almost entirely to the translation of scientific French.

[COURSES I-4, II-4]

Industrial History—E-6

PREPARATION: A-6

The economic history of a nation is not less interesting or dramatic than its political history, while it is absolutely essential to a thorough understanding of modern business conditions. The object of this course, which is intended for second year students, is to trace the development of the three leading industrial nations of the world, viz., the United States, England, and Germany, from simple, isolated agricultural communities to the complex industrial and commercial society of today. The course consists of weekly lectures supplemented by text-book reading. Among the topics treated are: natural resources; colonization, territorial expansion; manufactures; agriculture; finance; commerce; transportation; revenue tariffs; monopolies; governmental regulation; organization of labor; in-

dustrial legislation; immigration, conservation; contemporary problems. During the year each student will be required to write two or more theses on subjects connected with industrial history, in order that he may have practice in research work and also may continue his training in English.

[ALL COURSES]

Economics—E-7

PREPARATION: E-6

This course consists of lectures supplemented by recitations based upon both the lectures and a text book. The character of the course is descriptive rather than theoretical, and the aim is to acquaint the student with the accepted principles of economics and some of their applications to industrial conditions.

Among the topics discussed are: the nature and scope of economics; the evolution of economic society; the three factors of production, land, labor and capital; the four elements in distribution, rent, wages, interest, and profits; business organization; value and price; monopoly; money, credit, and banking; international trade; protection and free trade; transportation; insurance; economic activities of municipalities; and public finance. In short, the course deals with the fundamental principles that underlie a wide range of activities.

[COURSE I-4]

COTTON DEPARTMENT—F

Cotton Yarn Manufacturing—F-1

PREPARATION: B-1, B-3, B-7

Instruction is given by means of lecture and laboratory work. The outline of the course is as follows:

Fibre

Before taking up the details of the operation of manipulating the fibre into yarn a careful study is made of the characteristics and classification, both botanically and commercially of the many varieties of the cotton fibre. Methods employed in cultivating, marketing, grading, and stapling are considered and under these heads a detailed study is made of the types of gin employed.

Opening and Picking

Instruction in the preliminary operation of opening and picking covers the mechanical construction of the machines, their parts and adjustments as fully as the manufacturing results accomplished by the machines. This includes such construction details as Evener, Lap Measuring and Safety Stop Motion, Grids, Cleaning Trunks, Beaters, etc., also operation details which involve the adjustment of waste, drafts and character of laps.

Carding

The process of carding is considered one of the most important and proper time is devoted to the construction and operation of cards that the student will be familiar with the various parts of the card and the function and design of each. The construction and application of card clothing, as well as the methods of grinding, forms a part of the work. The influence of faulty parts, defective conditions and their remedy are included.

Drawing

Under this head is taken up the theory of doublings and their effect upon the quality of roving and yarn. Like previous and subsequent processes the machine construction forms an important part of the work. Proper stress is paid to such subjects as stop motions, drawing rolls and their covering, cleaners and eveners motions.

Roving Processes

Under this head is studied the various machines known as the Slubber, Intermediate, Fine and Jack Fly Frames. The relative motion of the various parts of these machines are so complex that a good opportunity is here presented to fix in the student's mind the application of certain mechanical principles that have use in other departments and upon other machines in the manufacture of textile material. With each process of yarn manufacture is explained the systems of sizing and numbering and under this head is taken up both the Metric and English systems.

Ring Spinning and Twisting

The consideration of spinning yarn by the ring frame method involves a knowledge of the uses to which the yarn is to be put, subsequent methods of handling that proper roving may be selected, suitable amounts of draft and twist provided, correct size of rings and travellers selected, building motions suitably adjusted, etc. The operation of twisting yarns is so closely related to spinning by the ring method that it is studied at the same time. This opens an almost limitless field of novelty yarn manufacture and offers a very good opportunity to derive new types of yarn or new mechanism to produce the effects. Yarn defects are studied with reference to the cause and remedy.

Mule Spinning

This method of spinning is very different from that of the ring frame and the mechanical details are more complicated. The student is furnished with new means of producing yarns and can compare the relative advantage of each method. A thorough understanding of mule spinning is perhaps more a study of mechanical motions and their functions. This results almost invariably in assisting the student to understand previous processes and machines better because of his work on the mule. It is the

object to make clear in the student's mind the principles underlying the construction and operation of the parts that control the Drawing, Twisting, Backing Off Winding, together with special motions and devices as are used upon the modern mule.

Combing

This process is explained by lecture work and by operation and assembling of the various types of combs in service in the laboratory. The object of combing is fully considered and the different means employed on the many types of combers on the market is studied. This includes such types as the Heilman, New Whittin and Nasmyth Combers.

Organization

Following the detailed study of the individual processes it is necessary to consider the relation of each to the other, the programs, balance of production, cost of machinery for various counts, quantities and styles of yarns. Under this heading is also studied such subjects as depreciation of machinery, cost systems, economics, arrangement of machinery, power demands, etc.

WOOLEN AND WORSTED YARNS—G

Manufacturing—G-1

PREPARATION: B-1, B-3, B-7

Raw Materials

A study of raw materials which enter into the manufacture of woollens or worsted yarns or are made into yarns by processes similar to those employed in the manufacture of woollen and worsted yarns, would include silk, Mohair, Alpaca, Vicuna, Cashmere, Camel's Hair, Cotton, Flax, Hemp, Jute and Ramie. In connection with these are considered Shoddy, Noils, Mungo and Extracts.

Wool Sorting

Familiarity with the various grades and kinds of wool, the physical and chemical structure is obtained by lecture and by actual sorting of fleece wool on the bench under the direction of an experienced wool sorter. The various characteristics, properties are explained, as are also trade terms such as Picklock XXX, XX, $\frac{1}{2}$ -Blood, $\frac{3}{8}$ -Blood, $\frac{1}{4}$ -Blood, Delaine, Braid, etc. Some skill is acquired in the estimation of shrinkage and in judging the spinning qualities.

Wool Scouring

The object of scouring and the methods employed are explained and this involves the consideration of the soaps and chemicals used in washing, also the waste products and their utilization. Actual work is done in scouring a commercial quantity of wool by machines that are made

similar in operation to regular commercial machines. A study is made of the effect of the hardness of water upon soap, also tests are made to show this effect. At the same time the use of driers, their operation and regulation is taken up, and the methods of carbonizing wool, noils, burr waste, rags, etc. are studied and practiced.

Burr Picking, Mixing and Oiling

In these processes, preliminary to carding, the students have an opportunity of mixing various colors of wools to produce different effects, and the influence of varying percentages of a given color in a mixture can be seen. Each student is required to make at least twenty sample mixes combining different colors and grades of stock, and to felt and mount the same. Under the subject of oils and emulsions are taken up, the characteristics of various oils and the means employed to test these. The use of Mixing and Burr Pickers is made clear.

Carding

The different systems of carding wool, depending upon whether it is to be made into woolen or worsted yarn, are fully explained, as is also the construction, setting and operation of the cards. A part of the work is the reclothing and grinding of the cylinders, strippers, workers, etc. The carding of suitable and commercial quantities of wool and the further manufacture of it into yarn serves to fix the principles of carding in the mind of the student, as well as gives him some skill in handling machinery. At the completion of this part of the work he is required to prepare and hand in a full description of the process of carding including working drawings, sketches, etc. to fully explain the machines and the methods.

Woolen Mule

The student studies thoroughly the operation of the mule as a whole, and acquaints himself with the various principal mechanisms, as for example, the Backing Off and Winding Motions, the Quadrant, Builder-rail, Faller Regulation, etc. He is required to run the mule and later hand in a thesis describing in full the machine, its parts and their operation.

Top Making and Combing

This branch takes up, besides the carding of the wool on a worsted card, the preparing processes, also gilling of the stock before and after combing. The construction of the gill boxes and combs is studied by lectures and by dismantling and assembling these machines in the laboratories. Later quantities of stock is made into top and then into yarn.

The Noble and Lister combs are studied and the various calculations to determine draft, noiling, productions, etc. are made.

Drawing and Spinning

The equipment in the laboratory offers opportunity to make worsted yarn by either the Bradford or Open Drawing System or by the French System. The process includes the various machines in the successive steps of making Bradford spun yarn and the functions of the different machines are studied. In the latter or French System the stock is run through the drawing machines and the roving spun into yarn on the French Mule. The same method of studying the mechanism and operations of these machines is followed as in the case of previous methods of instruction. The student by pursuing this course can compare the different methods of yarn manufacture and note the results of each.

With the instruction on the Bradford System is given work on the twistors and the effects that may be produced.

Organization

At the end of the course the lay-out of a properly balanced yarn mill is studied and at the same time the cost of the machinery, depreciation, labor costs and machinery arrangements.

[COURSES I-4, II-3, III-3, VI-3]

Textile Testing—G-2

The object of this course is to familiarize the student with present-day methods of determining the physical properties of textile fibres, yarns and fabrics. The application of physical laws and methods of measurements as studied in the course of Physics are used in the study of physical characteristics of textile material. The work is given to students in advanced courses and consists of lecture and laboratory work. Reports are prepared from each experiment giving the object of the experiment, method of procedure, observation and conclusions, in order that the student may acquire practice and understand the interpretation of data. A special testing laboratory has recently been constructed and a considerable number of the best standard fibre, yarn and fabric testing instruments of German make have been imported. The laboratory is equipped with means of making and keeping the humidity constant so that tests can be made under uniform or standard conditions of humidity and temperature.

FINISHING DEPARTMENT—H

Woolen and Worsted Finishing—H-1

PREPARATION: C-I, D-I, D-9

The outline of this course which is given by means of lecture and laboratory work is as follows:

Burling and Mending

Under this head is taken up for consideration the examination of flannel as it comes from the loom, the construction, use, and location

of the perch, the methods used in marking defects, measuring, weighing, and numbering of cloths, also the methods of inspection for fancies, single cloths, and double cloths. The object of burling, mending, and the types of tables employed, the method of removing knots, runners, etc., the object of back shearing and the use of burling irons, the replacing of missing threads and the importance of sewing as a part of the finishing process, are all considered in detail. The removal of oil and tar spots as well as stains of various kinds is studied.

Fulling

This branch covers a study of the conditions of the flannel as it comes from the loom, the influence of oil, size, etc. upon the procedure. Considerable time is devoted to the various methods of producing a felt, the early types of stocks, hammer falling and crank stocks, and their modifications and development into the present type of rotary fulling mills of both the single and double variety. The details of construction in all machines are carefully taken up and include the design and composition of the main rolls, methods of covering, regulation and means of adjusting the pressures of traps and rolls, consideration of the shoes, the use and regulation of the various types of stop motion, the different types of stretchers, guide rolls, and throat plates.

The theory of felt is taken up and the influence of pressure, moisture, heat, alkali, and acid is considered as well as the hygroscopic and felt-ing properties of different wool fibres. The preparation of the flannel for the mill and the usual methods of determining shrinkages as well as the various methods of soaping are given careful attention. The preparation of various fulling soaps and the value of each for the production of various degrees of felt as well as the determination of the proper amount of alkali for various goods are carefully studied and demonstrated. The manipulation of the various kinds of goods in the mill, viz.: all wool, shoddies, and mixed goods, is studied in class room and by operation in the mill.

The change in weight and strength for each operation are carefully considered, as is also the value of the flocks made in each. A study of the various methods of flocking, such as dry and wet are considered in both class and machine rooms. In each operation the defects likely to materialize are studied as well as the cause thereof, and various methods of modifying or lessening them.

Washing and Speck Dyeing

This branch considers the scouring, rinsing and washing of goods both before and after the fulling process; the various types of washers and the details of construction, such as suds box, rolls, etc. The theory of scouring, uses of Fuller's earth, salt solutions, and sours, on the different kinds of goods is made clear by practical work in the machine room, where the effects due to improper scouring such as stains, cloudy effects,

wrinkles and unclean goods, are demonstrated. The discussion of the necessity of speck dyeing follows naturally from the study of these matters and includes methods of preparation, materials used, application and tests required.

Carbonizing

This is an important branch of finishing and includes a study of the various carbonizing agents, methods of application, strength of solutions, and neutralizing, as well as the machines used. Stains and imperfections resulting from carbonizing are also considered. The drying and tentering machines and extractors employed are taken up at this point.

Gigging, Napping and Steaming

The construction in detail of the various types of gigs, nappers, steamers, wet gigs, rolling, stretching, crabbing and singeing machines, is discussed and their actions upon the cloth and the results obtained are explained.

Various methods of obtaining lustre and the production of permanent finish are considered in connection with steaming and sponging.

Brushing, Shearing and Pressing

This includes as do the other branches a careful treatment of the machines employed, the preparation of the cloth for each process, the action of each machine in producing its part of the resultant effect. With the manipulation of the shear comes the matters of setting, grinding, and adjustment. With the brushing machine the effect of steaming and moisture upon the lustre and feel of the goods is shown. A study of the action of the presses both plate and rotary involves consideration of pressure, steaming, etc. Special processes to obtain particular effects are taken up and the part played by each machine is explained. The details involved in handling cloth on a commercial scale, as for example, measuring, weighing, ticketing, numbering and rolling, are also explained. The necessary calculations and the methods of finishing all grades of goods are considered from time to time during the year.

[COURSES I-4, II-4, II-3, III-3, VI-3]

Cotton Finishing—H-2

PREPARATION: C-1, D-1, D-9

The outline of the course in the Finishing of Cotton Fabrics is as follows:

Cloth Room

Inspection of the various goods and the object thereof. Construction of the various types of inspecting and trimming machines.

Shearing

The object. A consideration of the various types of shears for treating one or both sides at the same time, also the use of the usual cleaning devices, such as emery, sand, and card rolls, beaters and brushes. Grinding and the adjustment of the various parts.

The use of brushing and cleaning machines, rolling devices, and calender attachments, for grey goods.

Singeing

Developing and object of singeing. The construction of singers of all types, and for various purposes. The use of cooling tanks, steaming-devices, rolling and brushing attachments.

Regulation of the flame for various goods and adjustment of the parts. Gas and air pressure, water cooled rolls. The effect of moisture on the cost of singeing. The use of dry cans in connection with singeing. Electric singeing.

Washing

Open width and string washers. Their construction and operation. Soaps, temperature, squeeze rolls. Washing of various goods and the object thereof. Stains.

Napping

The object of napping and the usual method of treating goods. Various types of nappers—Single and Double acting, Felting nappers. Construction, grinding, and adjustment of various types.

Water Mangles

Their object and the construction of various types. Various rolls, iron, husk, etc. Scutchers: their object and construction.

Starch Mangles

The object and construction of all types of starch mangles for pure starch and filled goods. Various types of rolls, brass, rubber, wood. Action of doctor blades, etc. Regulation and object of pressure.

Methods of starching and finishing all standard goods, also a consideration of the various substances used, such as starch, softener, and fillers. The preparation of starch and various methods of application.

Dryers and Stretchers

Both horizontal and vertical, tenter frames, clips. The swing motion and the finishes thus produced. Construction. Spraying machines, belt stretchers, button breakers. Their object and construction.

Calenders

The object and construction of all types, including the regulation of pressure and nips for the production of various finishes. Various types of rolls and their uses, steel, husk, and paper. The use of hot and cold rolls. Chasing, friction, embossing and Schriener calenders, and the various finishes produced by each. Production of watered effects. Beetling machines.

Making up room—yarding, inspecting. Different types of folds. Pressing, papering, marking.

[COURSES I-4, I-3, VI-3]

PHYSICAL CULTURE—I

This subject is required of all students registered for first year work. The course consists of general athletic exercises with small squads on the campus during the pleasant weather of the fall and spring, and exercises in the school gymnasium during the winter months. The instruction is given by the director of physical culture. Previous to the commencement of the work in the fall, each member of the class is required to submit to a thorough physical examination, a careful record of which is kept. Again at the end of the year another examination is held that progress may be noted.

The student's record depends both upon his regularity of attendance and upon the character of his work. A student who is not regular in attendance or who does not make sufficient progress in the work will be required to repeat the subject during the second year.

[ALL COURSES]

Evening Classes

ENTRANCE REQUIREMENTS AND FEES

All applicants to the evening classes must understand the English language and simple Arithmetic. Those who are graduates of a Grammar School are admitted upon certificate. A blank form for this will be found in the back of the catalogue. Those who cannot present such a certificate are required to take examinations in the subjects of English and Arithmetic. In the examination in English a short composition must be written on a given theme, and a certain amount must be written from dictation. In the examination in Arithmetic the applicant must show suitable proficiency in addition, subtraction, multiplication, division, common and decimal fractions, percentage, ratio and proportion. Opportunity to register or to take these examinations is offered each year, generally on the Thursday evenings of the three weeks previous to the opening of the evening school.

All students whether from Lowell or elsewhere taking courses in the Chemistry and Dyeing Department must before entering the laboratory make a deposit as follows:

Course IVa	\$ 5.00 per year
Course IVb, IVc or IVd	\$10.00 per year

This is to cover the cost of laboratory breakage and chemicals, and at the end of the year any unexpended balance is returned or an extra charge made for excess breakage.

The evening classes usually commence in the month of October and continue until about the middle of March. Some classes do not finish until April first. The school is open on four evenings each week during the period mentioned except when the school is closed for holiday recesses. The schedule showing the arrangements of classes for each term will be announced at the beginning of the school year.

Before entering class all students must fill out an attendance card which can be obtained at the office or from the instructors in the various departments. Any student who has filed an attendance card and who wishes to change his course, should notify the office to that effect.

COURSES

The evening classes offer to those who are employed during the day, instruction pertaining to their daily work or instruction in such branches as are related to the particular department in which they are engaged. Thus, one who is a weaver can carry on a course in Spinning or Designing. A dyer or an employee in a dye house can by means of a course in Chemistry and Dyeing acquire a better and more accurate knowledge of the chemicals and materials he is handling during the day. A machinist working on a lathe, planer, milling machine or at a bench, may add to his accomplishments, a knowledge of drafting, mechanism, and other subjects. This means that any man, young or old, who has the fundamentals of common school education, and who has the determination to advance, may secure in proper sequence the stepping stones to the place toward which he is looking, and rise to even the highest position in the industry.

The courses of the evening school are varied and arranged to meet the special needs of those engaged in the industry. They vary in length from one year to three and at the completion of each course, the certificate of the school is awarded, providing, however, that the student has been in attendance in the course during the year for which the certificate is granted.

No certificate will be awarded until all dues to the school have been discharged.

I. Cotton Spinning—2 Years

In this course the cotton is taken as it is raised in various parts of the world, and instruction is given in the various processes on all the machines from the gin to the spinning frame and mule. For one who desires only a study of combing, carding or spinning, it is possible to take that part of the course in which he

is particularly interested, although it is believed to be better for a spinner to know something about the machines and processes that precede his own. If one, all his life, has worked with one grade of cotton, an understanding of the other types and grades of cotton, of their properties, methods of cultivation, localities where grown, and uses to which they are adapted, cannot but help to broaden his intellect and make himself a more valuable man.

A detailed study of the machines including speeds, drafts, and settings explains and makes clear to the student the arbitrary orders of the mill overseer. There is not time in the mill for explanations as to why a certain change gear is used or how the draft constant is determined. The relative advantages of the many types of mechanisms are considered.

IIa. Woolen Spinning—2 Years

IIb. Worsted Spinning—3 Years

In both courses the students of the first year pursue the same class work covering instruction in the many kinds of wool, the varying properties of the fibres, trade terms, sorting, scouring, carbonizing, etc. This work is followed by instruction in carding and mule spinning for the woolen students. For those desiring to study worsted yarn manufacture work is taken up on the worsted card, followed by gilling and combing and processes of top making. The last year of this course is devoted to a study of worsted yarn manufacture on both the English and French systems.

Thus in three years' time one may acquire a thorough course of instruction in worsted yarn manufacturing, or in two years, a knowledge of woolen yarn manufacture. He is thus able to obtain a knowledge of machines and processes that could not be obtained in the ordinary course of events in the mill.

IIIa. Textile Design—3 Years

For one who is working in the design, pattern or weave room, the course in design offers instruction in the great variety of weaves, in cloth construction and analysis. It is practically impossible under ordinary circumstances for one to acquire in

the mill a knowledge of the construction of the many textile fabrics. Where a person spends the greater portion of his life in one or two mills, his knowledge of fabrics is confined to those made in the mills in which he works. A course in designing supplements the experience received during the day, thus broadening a person's textile knowledge as well as making him better acquainted with the fabrics upon which he works daily.

IIIb. Freehand Drawing—3 Years

In the course in Freehand Drawing, instruction is given in the drawing from models, casts and designs. Work is taken up in charcoal and also in colors. This course has appealed to many young women of the city and it is believed that this is a most fortunate opportunity for both young women and young men of Lowell to acquire the elements of artistic designing.

IVa. Elementary Chemistry—2 years

General Chemistry including Inorganic and Organic. Qualitative Analysis.

IVb. Textile Chemistry and Dyeing—3 years

Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Dyeing.

IVc. Analytical Chemistry—3 years

Laboratory Work and Lectures in Quantitative Analysis.

IVd. Textile and Analytical Chemistry—4 years

Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Analytical Chemistry.

Hardly any branch of applied science plays so important a part in our industrial world as Chemistry. Many large mills employ the chemist as well as the dyer, and with the great progress which is being made in the manufacture and application of dyestuffs, a basic knowledge of chemistry becomes an absolute necessity to the dyer. Within a comparatively short distance from Lowell are establishments employing men who require some knowledge of chemistry but who may not necessarily use dyes. Some find a knowledge of analytical chemistry helpful in their everyday work.

To meet these varying needs of our industrial community, the school offers a two year course in General Chemistry, Organic and Inorganic, which may be followed by any one of three courses, viz., Textile Chemistry and Dyeing, Analytical Chemistry and Textile and Analytical Chemistry. In order to take Courses IVb, IVc or IVd, candidates must have a certificate from Course IVa, or show by examination or approved credentials that they have taken the equivalent of the work covered by this course.

Va. Cotton Weaving—1 year

Vb. Woolen and Worsted Weaving—1 year

Vc. Dobby and Jacquard Weaving—1 year

These are called weaving courses, but in reality they might more properly be called courses in loom fixing for particular attention is given to the mechanism of the looms, the timing of the various parts and the adjustments possible to produce desired results. Here again, is an opportunity for students to fix, dismantle, erect and adjust looms in a way that could not be tolerated in any mill. Frequently students come to the classes with the knowledge that certain adjustments must be made upon a loom if certain results are to be obtained, but the reason for these is not known. The school offers the machine, time and instructor in order that the weaver, or loomfixer, may determine for himself the reason for some rule which he practices in his daily work. Not only can he become more familiar with the loom upon which he works every day, but he can study the operations of many other makes of looms.

VIa. Elements of Engineering—3 years

VIb. Mechanical Drawing—3 years

VIc. Machine Shop Practice—2 years

These courses have been arranged with the object of offering to those engaged in the mechanical and electrical departments of our mills, opportunities to learn something concerning the theory underlying the many practical methods which they pursue during the day.

Under the head of Elements of Engineering is given instruction in Mechanics and Mechanism of machines for one

year, followed by a year's course on steam boilers and engines with the auxiliary apparatus found in a modern steam plant. In the third year a brief course in Applied Electricity takes up, as far as time will permit, instruction in alternating and direct current generators, motors and apparatus.

For one having occasion to make a sketch or detail drawing for the purpose of illustration or instruction, or for one who is daily required to work from a drawing or blue print, the course in Mechanical Drawing is offered. It first lays a foundation of the principles of mechanical drawing and follows this with two years' work in drawing directly from parts of machines, preparing both the detail and the assembly drawing.

The Machine Shop Course is almost self-explanatory. The school has one of the best equipped shops for instruction purposes in this vicinity. Nearly all of the standard machine tools are represented, and it is possible to do almost any kind of machine tool work which comes within the range of the tools.

Thus it becomes possible for one who may be working at the bench during the day to learn how to operate a lathe or other tool, or for a lathe hand to acquire a knowledge of a planer, shaper, milling machine, grinder, etc. A man who has a knowledge only of the special machine which he operates, may by means of this course, become a more intelligent machinist. He should supplement this course with the courses in Mechanical Drawing and Mechanism in order that his training for an all-round machinist or mechanic may be more complete.

VII. Woolen and Worsted Finishing—1 year

In this course machine work is supplemented by lectures and discussions pertaining to the many finishes given to woolen and worsted fabrics. The action of soaps, water, steam, heat and cold upon wools in cloth or the combination of this fibre with others used in commerce is carefully studied. This course also helps the finisher to broaden his knowledge of textile fabrics.

OFFICERS OF ADMINISTRATION AND INSTRUCTION

Principal

CHARLES H. EAMES, S. B., Massachusetts Institute of Technology, 1897. Active member of The American Society of Electrical Engineers. Experience: Secretary of the Lowell Textile School and instructor in electrical engineering and mathematics; superintendent, Light, Heat and Power Corporation, Lowell, and engineer with Stone and Webster, electrical engineers, Boston, Mass.

Instructors

TEXTILE ENGINEERING

GEORGE H. PERKINS, S. B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience: Draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood Greene and Co., Boston, Mass.

HERBERT J. BALL, S. B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906. Experience: Draftsman, Watertown Arsenal.

ULYSSES J. LUPIN, S. B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: Draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.

DAVID M. HUNTING, A. B., S. B., assistant instructor in mechanical drawing. Harvard College, 1904; Massachusetts Institute of Technology, 1912.

CHARLES H. JACK, instructor in machine shop practice. Lowell Textile School. Experience: Amoskeag Manufacturing Company, Manchester, N. H.

MARCUS J. COLE, instructor in mechanical drawing. Evening School. Massachusetts Institute of Technology, 1909. Experience: Bigelow Carpet Co., Lowell, Mass., Engineering Department.

CHEMISTRY AND DYEING

LOUIS A. OLNEY, S. B., M. S., chief instructor. Lehigh University, 1896. Experience: instructor, Brown University; dyeing and finishing department, Stirling Mills, Lowell, Mass.

HOWARD D. SMITH, PH. D., instructor in chemistry. Tufts College, 1906; Brown University, 1904; Rhode Island College, 1901. Experience: assistant instructor, Brown University and Tufts College; instructor, Beloit College, Wisconsin.

- ROBERT R. SLEEPER, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday and Sons, Limited, New York City; H. A. Metz and Co., New York City; Hamilton Print Works, Lowell, Mass.; Merrimack Manufacturing Company, Lowell, Mass.
- BERTRAND F. BRANN, S. B., M. S., instructor in chemistry. University of Maine, 1909. Massachusetts Institute of Technology, 1912. Experience: Instructor at University of Maine. Assistant Instructor Department of Research, Massachusetts Institute of Technology.
- RUSSELL B. STODDARD, A. B., instructor in chemistry. Clark College, 1912.
- HAROLD W. LEITCH, assistant instructor in chemistry. Lowell Textile School, 1912.
- ELLIOTT B. PLUMMER, assistant instructor in dyeing. Lowell Textile School, 1913.

TEXTILE DESIGN AND WEAVING

- HERMANN H. BACHMANN, chief instructor. Gera Textile School, Germany. Experience: Gustav Weise Public Designing House for the City of Gera; Parkhill Manufacturing Company, Fitchburg, Mass.; Lorraine Manufacturing Company, and Smith Webbing Company, Pawtucket, R. I.
- STEWART MACKAY, instructor in textile design and cloth analysis. Lowell Textile School, 1906. Experience: Bay State Mills, Lowell, Mass.; George C. Moore Wool Scouring Mills, North Chelmsford, Mass.
- JOSEPH WILMOT, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.; Draper Company, Hopedale, Mass.; Crompton and Knowles Loom Works, Worcester, Mass.
- ALBERT E. MUSARD, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa.; and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder and Ellis, Philadelphia, Pa.; Nye & Wait Carpet Co., Auburn, N. Y.
- E. ELIZABETH WHITNEY, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching eighteen years.

COTTON YARNS

- STEPHEN E. SMITH, chief instructor. Lowell Textile School, 1900. Experience: draftsman, Saco-Lowell Shops, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.
- HENRY K. DICK, instructor in cotton spinning and knitting. Experience: Linnville Hosiery Factory, Lanark, Scotland.
- GEORGE GOODCHILD, instructor in cotton spinning, Evening School. Lowell Textile School, 1903. Experience: Draftsman, Saco-Lowell Shops, Lowell, Mass.

WOOLEN AND WORSTED YARNS

- EDGAR H. BARKER, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, Mass.; wool scouring.
- JOHN N. HOWKER, instructor in wool sorting and scouring. Technical School of Saltaire near Bradford, England; certificate from City and Guilds of London. Experience: Saltaire Mills, Yorkshire, England; Goodall Worsted Company, Sanford, Maine; Arlington Mills, Lawrence, Mass.
- JOHN C. LOWE, instructor in woollen and worsted yarns. Lowell Textile School, 1911. Experience: Wood Worsted Mills, Lawrence, Mass.

FINISHING

- ARTHUR A. STEWART, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woolen Manufacturing Company, Montreal, Canada; American Woolen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor in woollen and Worsted yarns, Lowell Textile School.

LANGUAGES AND HISTORY

- LESTER H. CUSHING, A. B., Harvard College, 1911.

PHYSICAL CULTURE

- RALPH E. GUILLOW, physical director. International Y. M. C. A. Training School, Springfield, Mass., 1910. Ten years' experience in physical culture in various schools and institutions.
- ARCHIBALD R. GARDNER, M.D., medical adviser. Harvard University, 1902.

ALUMNI ASSOCIATION

The Alumni Association of the School holds its annual meeting and banquet in Lowell on commencement day.

The membership of the Association is restricted to graduates of the day school. Honorary membership is open to the Board of Trustees, the Faculty and such others as may be elected by the Association.

The officers for the year ending June, 1914 are:

President:	Robert L. Lamont, '12
Vice-President:	Charles J. Cleary, '13
Secretary-Treasurer:	Arthur A. Stewart, '00

Board of Directors: The President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, for one year, and Stephen E. Smith, '00, for two years. Communications should be addressed to Arthur A. Stewart, Lowell Textile School.

ENTERTAINMENT COMMITTEE

Royal P. White	Robert R. Sleeper
Harold W. Leitch	

OLNEY CHEMICAL ALUMNI OF THE LOWELL TEXTILE SCHOOL

This association was organized in 1908, for the purpose of keeping its members in closer relationship with each other and the school.

The membership consists of evening graduates from any of the advanced courses in chemistry and dyeing of the Lowell Textile School, and is composed of thirty members at present.

The annual meeting is held during the winter months at the school, and the annual reunion is held the third Saturday of June at a place selected by the Board of Control.

OFFICERS

President:	Hugh Christison, Methuen, Mass.
Vice-President:	James Spurr, Lawrence, Mass.
Secretary and Treasurer:	Stephen W. Bastow, Wakefield, Mass.

BOARD OF CONTROL

President, Vice-President, Secretary, also John Nicoll, Andover, Mass., Forster Heaton, Millbury, Mass., Harry Buckley of Methuen, Mass., John A. Barrington, Boston, Mass.

O. C. A. PRIZE COMMITTEE

H. Stewart Redman
Forster G. Heaton
Peter F. O'Neil

This association will offer each year a book prize to the evening graduate who attains the highest standing in any one of the advanced courses of the Chemistry and Dyeing Department.

For information regarding this association please apply to Stephen W. Bastow, Secretary, Wakefield, Mass.

DAY CLASS OF 1913

Graduates with Titles of Theses

Degrees conferred as follows June 6, 1913:

Otis Milton Holmes	Bachelor of Textile Engineering Thesis 1912	Haverhill, Mass.
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George Robert Pensel	Bachelor of Textile Dyeing "Chemical Methods for Determination of Relative Value of Dyestuffs."	Fitchburg, Mass.
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Diplomas awarded as follows June 6, 1913:

Herbert Bowen Bennett	Wool Manufacturing "The Manufacture of a Worsted Suiting."	Lowell, Mass.
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Charles Joseph Cleary	Wool Manufacturing "The Manufacture of a Worsted Suiting."	Boston, Mass.
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Kenneth Bartlett Cook	Cotton Manufacturing "The Manufacture of a Fancy Leno."	Concord, Mass.
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Arthur Napoleon Davieau	Textile Engineering "Efficiency Tests of 7½ H. P. Variable Speed D. C. Motor."	Cochituate, Mass.
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Alexander Duncan Davis	Textile Engineering "Economy Tests of 500 K. W. Bleeder Type Turbine at Lowell Bleachery, Lowell, Mass."	Lowell, Mass.
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Roy Dearborn	Textile Engineering "Investigation of the Vibration and Oscillation of a Mill Building."	Andover, Mass.
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Arthur Norton Gadsby	Wool Manufacturing "The Manufacture of a Worsted Suiting."	North Adams, Mass.
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Chester Temple Horton	Textile Engineering "Tests of Steam Flow in Kerr Turbine Nozzles."	Wilmington, Mass.
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Arthur Kimbal Johnson	Chemistry and Dyeing	Andover, Mass.
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Harold Thomas Mather	Textile Engineering "Economy Tests of 500 K. W. Bleeder Type Turbine at Lowell Bleachery, Lowell, Mass."	Lowell, Mass.
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James Murray	Chemistry and Dyeing "The Identification of Organic Dyestuffs."	Lawrence, Mass.
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Carroll Wilmot Peck	Chemistry and Dyeing "Bleaching and Dyeing of Jute."	Marshfield, Mass.
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- Ray Charles Pillsbury Cotton Manufacturing Manchester, N. H.
 "The Manufacture of a Fancy Bedford Cord."
- Elliott Barton Plummer Chemistry and Dyeing Lawrence, Mass.
 "The Identification of Organic Dyestuffs on Textile Fibre."
- Philip Clayton Putnam Chemistry and Dyeing Danvers, Mass.
 "Investigation to Determine the Relative Absorption of
 Dyestuffs by Different Varieties of Wool and by
 same Wool Scoured under Different Conditions."
- Richardson Perry Richardson Cotton Manufacturing Lowell, Mass.
 "The Manufacture of a Fancy Cotton Dress Goods."
- Charles Emile Sylvain Textile Engineering Lowell, Mass.
 "Tests of Steam Flow in Kerr Turbine Nozzles."
- Ernest Dean Walen Textile Engineering Gloucester, Mass.
 "Efficiency Tests of $7\frac{1}{2}$ H. P. Variable Speed D. C. Motor."

EVENING CLASS OF 1913

Certificates awarded as follows, April 23, 1913:

COURSE Ia—2 YEARS. (Cotton Spinning)

Edward James Cox	Lowell, Mass.
Lester Howard Cushing	" "
Edward Hanson	" "
Alexander Thomas Herron	" "
John Howker	" "
Herbert Jones	" "
Lloyd Andrew Kirkpatrick	" "

COURSE Ib—1 YEAR. (Knitting)

Ernest Parker Miller, Jr.	Lowell, Mass.
Ernest H. Nelson	" "
Henry Stewart Redman	" "

COURSE IIa—2 YEARS. (Woolen Spinning)

Walter Jerome Jackson	Lawrence, Mass.
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COURSE IIb—3 YEARS. (Worsted Spinning)

William Ernie Beaulieu	Lowell, Mass.
Edward Francis Hannagan	Lawrence, "
Seth Lambert	Methuen, "
Walter Beckwith Metcalfe	North Chelmsford, "
William Olney Randall	Lawrence, "
Sidney Rupert Rollins	" "

COURSE IIIa—3 YEARS. (Textile Designing)

Charles Henry Giffin	Lowell, Mass.
George Richard Giffin	" "
Alfred Higgins	Lawrence, "
Andrew Younger	Lowell, "

COURSE IIIb—3 YEARS. (Freehand Drawing)

Hilding Carl Ekengren	Lowell, Mass.
Annie Cecilia McGowan	" "

COURSE IVa—2 YEARS. (Elementary Chemistry)

William John Allen	Lawrence, Mass.
Reginald Atkinson	Lowell, "
Mary Frances Devine	" "
Harold Elmore Gile	Lawrence, "
Harold Wainwright	" "

COURSE IVb—3 YEARS. (Textile Chemistry and Dyeing)

George Clifford Dunn	Lowell, Mass.
James Brandon Manning	" "
John Nicoll	Andover, "
William Paris Whitman	Lowell, "

COURSE IVc—3 YEARS. (Analytical Chemistry)

Joseph Albert LaJeunesse	Lowell, Mass.
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COURSE Va—1 YEAR. (Cotton Weaving)

Frank Edward Learned	Methuen, Mass.
Harry Freer Lowe	Lowell, "

COURSE Vb—: YEAR. (Woolen and Worsted Weaving)

Arthur Grant Abbott	Lawrence, Mass.
Harry Anderton	Lowell, "
Cyrus Joseph Bassett	" "
Alexander Scott Black	Lawrence, "
John Patrick Breen	Lowell, "
Andrew Kerr Innes	Lawrence, "
Charles Jarvis	Andover, "
Samuel Scott Kershaw	North Chelmsford, "
Andrew Francis Maguire	Lowell, "
Frank Louis Orrell	" "
George Preble	" "
David Douglas Shearer	Lawrence, "

COURSE Vc—: YEAR. (Dobby and Jacquard Weaving)

James Doran Breen	Lowell, Mass.
Walter Henry Classon	Nashua, N. H.
Efthimios Z. Daskalakis	Lowell, Mass.
William Adams Lang	" "
Leo Timothy Murphy	" "
Henry Alexander Musard	" "
George Preble	" "
James Joseph Reynolds	" "

COURSE VIa—3 YEARS. (Elements of Engineering)

Charles William Bell	Lowell, Mass.
Peter Charleton	" "
Fred Joseph Cote	Lawrence, "
Loyd Henry Gordon	Lowell, "
Louis Charles Hoelzel	Lawrence, "
William Shaw	Lowell, "
Michael Francis Sullivan	Dracut, "

COURSE VIb—3 YEARS. (Mechanical Drawing)

Raymond James Leaver	Lawrence, Mass.
William Archibald McDonald	Lowell, "

COURSE VIc—2 YEARS. (Machine Shop Practice)

Wesley James Clarke	Ballardvale, Mass.
Edward Thomas Cudmore	Lowell, "
John Basil Doyle	" "
William Robert Forrest	" "
George Dorsey Freeman	" "
James Patrick McGurn	" "
Patrick Henry Monahan	" "
Ernest Richard Orrell	" "
William Nelson Soule	" "

COURSE VII—1 YEAR. (Woolen and Worsted Finishing)

Fred Sherburn Buzzell	Methuen, Mass.
Ralph Albert Butland	Lawrence, "
Charles William Leonard	Lowell, "
Wilfred Benjamin Maynard	" "
James Henry Quinn	Lawrence, "
Robert Hume Redpath	" "
Robert Reid Sleeper	Lowell, "
Albert Greaves Sugden	" "
Joseph Wilkinson	" "

REGISTER OF DAY STUDENTS 1913 - 1914

Fourth Year

Name	Course	Address
Davis, Alexander D.	VI	Lowell, Mass.
Horton, Chester T.	VI	Wilmington, "
Leitch, Harold W.	IV	North Andover, "
Walen, Ernest D.	VI	Gloucester, "

Third Year

Abbott, Fred. A.	II	Lowell, Mass.
Blake, Parker G.	VI	Cambridge, "
Bradley, Raymond F.	VI	Gloucester, "
Brickett, Raymond C.	II	Haverhill, "
Casey, William F.	I	Allston, "
Cosendai, Edwin F. E.	IV	Lowell, "
Crawford, Jack W.	IV	Lawrence, "
Creese, Guy T.	IV	Danvers, "
Dawson, George I.	VI	Somerville, "
Dorr, Clinton L.	VI	Malden, "
Fisher, Russell T.	VI	Gloucester, "
Folsom, Harold G.	IV	Lowell, "
Greer, John H., Jr.	IV	Lawrence, "
Heller, Lewis L.	Sp. II	Washington, D. C.
Kyle, George S.	I	Lowell, Mass.
Lane, Oliver F.	IV	" "
Lawson, Edward R.	VI	Andover, "
Lillis, Marvin H.	IV	Lawrence, Mass.
McCreery, Robert W.	I	Glens Falls, N. Y.
McGowan, Frank R.	VI	Lowell, Mass.
Messenger, George A.	IV	Chicopee Falls, "
Neyman, Julius E.	IV	Lowell, "
Rich, Edward	IV	" "
Richardson, George O.	IV	Andover, "
Sawyer, Joseph W.	IV	Lawrence, "
Tucker, Harold B.	VI	Stoneham, "

Second Year

Adams, Arnold B.	VI	East Bridgewater, Mass.
Adams, Floyd W.	VI	Madison, Me.
Alliot, Eric	I	Passaic, N. J.
Carlson, Ernest B.	VI	West Chelmsford, Mass.
Church, Charles W.	I	Housatonic, "
Coleman, Wesley D.	IV	Cambridge, "
Dickson, Earle E.	I	Holyoke, "
Dimock, Dwight L.	IV	Billerica, "
Echmal, John G.	VI	Lowell, "
Farnsworth, Harold V.	VI	Winchester, "
Ford, Austin L.	II	Lowell, "
Forsaith, Ralph A.	VI	Nashua, N. H.
Frothingham, William A.	IV	Portland, Me.
Goodell, Josiah B.	II	Lowell, Mass.
Harrington, Thomas	IV	Cambridge, "

Name	Course	Address
Harvey, Wendell P.	IV	Lowell, Mass.
Holt, Justin G.	I	Somerville, "
Howarth, Charles L.	IV	Lowell, "
Irvine, James A.	VI	Chicago, Ill.
Kirby, Donald T.	IV	Lowell, Mass.
Lamprey, Leslie B.	IV	Lawrence, "
Leonard, Charles W.	IV	Lowell, "
Macnee, Forrest F.	II	New York, N. Y.
Milot, Aram A.	II	Taunton, Mass.
Mitchell, Charles B.	VI	Lowell, "
Morrill, Howard A.	VI	Saco, Me.
Newell, Herbert M.	I	Pawtucket, R. I.
O'Brien, Philip F.	II	Wayland, Mass.
Putnam, George I.	IV	Boston, "
Richmond, Lysander	IV	Middleboro, "
Riggs, Homer C.	VI	So. Essex, "
Sanborn, Ralph L.	VI	West Kennebunk, Me.
Simpson, Kenneth M.	VI	Malden, Mass.
Sturtevant, Herbert A.	I	Cambridge, "
Tenney, Frank F.	VI	Manchester, "
Wells, Frank H.	VI	Clinton, "

First Year

Albrecht, Charles H.	IV	Dorchester, Mass.
Andrews, Henry B.	VI	Hingham Center, "
Baker, William J.	IV	West Groton, "
Barlofsky, Archie	VI	Lowell, "
Billings, Howard	IV	East Acton, "
Blanchard, Walter R.	IV	Swampscott, "
Brearley, Earl B.	IV	Killingly, Conn.
Brinckerhoff, Herbert W.	IV	Newton Centre, Mass.
Chase, Charles A.	Sp. III	Cambridge, "
Clark, Leo R.	III	Rochester, N. H.
Colby, James T.	VI	Manchester, "
Cubberly, Norman P.	VI	Malden, Mass.
Cummings, Edward S.	VI	Lowell, "
Davieau, Alfred E.	VI	Cochituate, "
Deady, William F.	IV	Uxbridge, "
Dover, Henry H.	II	Winchester, "
Fitzgerald, Eugene N.	—	Brighton, "
Folkins, Ralph M.	II	Cambridge, "
Foster, Boutwell H.	VI	Lowell, "
Fuller, Allen R.	IV	Dorchester, "
Garmon, Joseph P.	VI	Lowell, "
Gerrish, Henry K.	III	" "
Gilley, Frederick S.	VI	Somerville, "
Gilmore, Hazel S.	Sp. III	Lowell, "
Harris, Lawrence R.	III	Greenwood, "
Heney, Fred C.	VI	Laconia, N. H.
Kanter, Louis H.	VI	Boston, Mass.
Kapenekas, Mike J.	Sp.	Providence, R. I.
Lawrence, Harold E.	VI	Melrose, Mass.
Lewis, Richard B., Jr.	III	Winthrop, "
Mehlman, Elliot L.	VI	Gloucester, "
Mitchell, Malcolm M.	Sp.	Dedham, "
Molloy, Francis H.	II	Hudson, "

Name	Course	Address
O'Connor, Lawrence D.	VI	Woburn, Mass.
Park, Kenneth B.	IV	Winchester, "
Peabody, Roger M.	II	Everett, "
Perlman, Samuel	IV	Lowell, "
Potter, Robert C.	IV	" "
Powers, Walter W.	IV	Brookline, "
Purcell, James	IV	Webster, "
Quinn, Leo E.	II	Lowell, "
Racicot, Marie E.	Sp. III	" "
Shaber, Hyman J.	VI	Nashua, N. H.
Sjostrom, Carl G. V.	III	Ware, Mass.
Smith, Byron D.	VI	North Hampton, N. H.
Smith, Malcolm H.	VI	Gloucester, Mass.
Sokolsky, Henry	VI	Lowell, "
Sturtevant, Albert W.	IV	" "
Summersby, William C.	III	Lawrence, "
Tabor, James A.	II	Corinna, Me.
Townsend, James G.	II	East Boston, Mass.
Tyler, Lauriston W.	II	Haverhill, "
Ujueta, Arnaldo	Sp. IV	Lowell, "
Wallace, John C.	Sp. III	Andover, "
Weeks, Duncan A.	Sp. I	Lowell, "
Woods, George W.	IV	Groton, "
Woods, Harvey A.	II	" "

Post Graduates

Name	Address
Barr, I. Walwin	New York, N. Y.
Brickett, Chauncy J.	Scranton, Pa.
Carter, Robert A.	Philadelphia, Pa.
Cole, James T.	Belmont, Mass.
Culver, Ralph F.	Wilmington, Dela.
Foster, Clifford E.	Lowell, Mass.
Haskell, Walter F.	Westbrook, Me.
Hildreth, Harold W.	Lawrence, Mass.
Hollings, James L.	Brooklyn, N. Y.
Knowland, Daniel P.	New York, N. Y.
Mailey, Howard T.	Lawrence, Mass.
Moorhouse, William R.	Boston, Mass.
Reynolds, Fred B.	North Andover, Mass.
Sleeper, Robert R.	Lowell, Mass.

REGISTER OF EVENING STUDENTS

1913 - 1914

Explanatory Note

Course Ia Cotton Spinning
 Course Ib Knitting
 Course IIa Woolen Spinning
 Course IIb Worsted Spinning
 Course IIIa Designing
 Course IIIb Freehand Drawing
 Course IVa Elementary Chemistry
 Course IVb Textile Chemistry and Dyeing
 Course IVc Analytical Chemistry
 Course IVe Special Chemistry
 Course Va Cotton Weaving
 Course Vb Woolen and Worsted Weaving
 Course Vc Dobby and Jacquard Weaving
 Course VIa Elements of Engineering
 Course VIb Mechanical Drawing
 Course VIc Machine Shop
 Course VIe Mathematics
 Course VII Woolen and Worsted Finishing

Post Graduates

Name	Course	Address
Bernard, Joseph E.	VId	Lowell, Mass.
Blais, J. Emile	VId	" "
Blanchette, Eugene	IIIb	" "
Cudmore, Edward T.	VId	" "

Third Year

Anderson, James	VIa	Lawrence, Mass.
Atkinson, Henry	IIIa	Lowell, "
Bachmann, Walter H.	IIIb	" "
Berr, Herbert A.	IIIa	Lawrence, "
Bixby, Edward E.	IIIa	Lowell, "
Brown, James H.	VIa	Forge Village, "
Brown, Leon E.	VIa	Lowell, "
Burns, Richard L.	VIb	" "
Campling, Frank	IIb	Methuen, "
Carey, Wm. H.	VIa	Lowell, "
Collins, Frank	VIa	Forge Village, "
Cooper, George H.	Ia	Lowell, "
Cox, Edward J.	Ia	" "
Davis, Arthur	VIa	" "
Devine, Henry F.	VIa	" "
Donahue, Wm. E.	VIb	" "
Doran, Hugh J.	Ia	" "
Dowd, Martin F.	IIIa	Lawrence, "
Driscoll, Charles E. C.	VIa	" "
Early, Wm. E.	VIb	Lowell, "
Eichhorn, Paul A.	VIa	Lawrence, "
Eveleth, Paul H.	IIIa	Lowell, "

Name	Course	Address
Favreau, Alberic J.	VIa	Lowell, Mass.
Fernald, Hiram T.	VIa	" "
Freeman, Ralph W.	IVb	" "
Gibbons, James J.	VIa	Lawrence, "
Gill, Homer	VIa	Lowell, "
Gilman, Edward T.	VIa	" "
Hall, Sydney H.	VIb	" "
Hanson, Edward	Ia	" "
Hartford, Christopher W.	VIa	" "
Henzie, John J.	IIIa	" "
Hill, Bruce	IIIa	Methuen, "
Hill, Merle H.	VIa	Lowell, "
Horman, Charles P.	IIIa	" "
Huse, Charles H.	VIb	" "
Ingham, Benj. W.	Ia	" "
Jackson, Walter J.	IIIa	Lawrence, "
Johnson, Alger G.	VIa	Lowell, "
Keenan, Wm. F.	VIa	" "
Kelley, George H.	VIa	" "
Kirkpatrick, Lloyd A.	Ia	" "
Laurin, Erick T. L.	VIb	" "
Leaver, Harold E.	IIb	Lawrence, "
Leith, Joseph E.	IIIa	Lowell, "
Lewis, Charles S.	VIa	" "
McDermott, Nelson J.	VIa	" "
MacKenney, Harold E.	IIIb	" "
McLaughlin, Laurence H.	VIa	" "
Mack, Clarence P.	IIIa	Lawrence, "
Macnee, Forrest F.	IIb	Lowell, "
Maxwell, Wm. A.	VIa	" "
Moffatt, Edward J.	VIa	" "
Monty, Henry J.	Ia	" "
Mowatt, John	VIa	" "
Murray, Paul W.	VIb	" "
Murray, Walter J.	VIa	" "
Nichol, Samuel J.	IVb	" "
Nichols, Fernald H.	VIb	" "
Noonan, James J.	VIa	" "
Norris, Henry A.	VIa	" "
O'Brien, Frederick A.	VIb	" "
O'Hagan, Christopher	VIb	" "
O'Neill, Charles F.	IVc	" "
Pihl, Mansfred M.	VIb	" "
Reed, Frank E.	VIa	" "
Richards, Raymond A.	IIIb	" "
Richburg, Clyde W.	IIIb	" "
Roesler, Alfred	IIIa	Lawrence, "
Rouine, Francis E.	VIb	Lowell, "
Royds, James	Ia	" "
Schmidt, Hartman F.	IIb	Lawrence, "
Shaw, Albert	VIb	Lowell, "
Sheehan, John P.	VIa	" "
Smith, Leonard	VIa	Methuen, "
Snickers, Eugene	Ia	Lowell, "
Torpey, Henry K.	VIb	" "
Towne, Raymond	VIa	North Andover, "
Turner, Roscoe C.	IIb	Lowell, "
Underwood, Leslie H.	VIa	" "

Second Year

Name	Course	Address
Abbott, George E.	IIb	Lawrence, Mass.
Alter, Frederick A.	IVa	" "
Ballinger, Raymond F.	VIIb	North Chelmsford, "
Barnes, Hammond	Ia	Lowell, "
Bedell, Henry B.	IIb	North Andover, "
Birdsall, James E.	IIb	Lawrence, "
Bordeleau, George A.	IIIb	Lowell, "
Brady, Edward P.	IVa	" "
Branch, Guy E.	IIb	Lawrence, "
Brandy, Wm. F.	IVa	" "
Brierly, James	IIIa	North Andover, "
Burke, John J.	IVa	Lowell, "
Butland, Ralph A.	IIb	Lawrence, "
Cahill, Thomas P.	VIId	Lowell, "
Campbell, Charles F.	IIIb	" "
Campbell, Frank J.	VIIb	" "
Campbell, Thomas J.	IIIb	" "
Cherry, Adelaide P.	IIIb	" "
Christenson, John O.	IIIb	" "
Cinqmars, Adelard D.	VIa	" "
Clark, John H.	IVa	Lawrence, "
Cochrane, Wm.	IVa	Lowell, "
Cooper, George H.	Ia	" "
Corr, James F.	IIIa	" "
Delderfield, John W.	VIId	" "
Donahue, Wm. E.	VIa	" "
Doole, James E.	IVa	" "
Doole, John T.	IVa	" "
Dumais, Marie L.	IIIb	" "
Ecclestone, Arthur G.	VIIb	" "
Emmons, Harry I.	IVa	Lawrence, "
Erbe, Wm.	IVa	" "
Ford, Joseph L.	IIIa	" "
French, George W., Jr.	IIIa	" "
Gearin, John W.	VIIb	Lowell, "
Gill, Gardner G.	IVa	" "
Godair, Joseph J.	IIIa	Dorchester, "
Goddard, Harold W.	VIIb	Methuen, "
Goddard, Walter L.	IIIa	Lawrence, "
Goodrich, Byron M.	IIb	Methuen, "
Gustafson, Alfred L.	VIa	Lowell, "
Haithwaite, Albert	Ia	" "
Hanley, Edward T.	IIb	Forge Village, "
Hanson, Winfield S.	IVa	Lowell, "
Hartley, Ralph F.	IVa	Winchester, "
Hashmatian, Harry	IIIb	Lowell, "
Hayden, John J.	VIa	" "
Heath, Thomas A.	VIIb	" "
Herron, Alexander T.	IVa	Lawrence, "
Hill, Wm. L.	Ia	Lowell, "
Hilton, Wm. J.	VIa	Lawrence, "
Hinckley, Daniel W.	Ia	Lowell, "
Hosmer, Charles A.	Ia	" "
Howe, Charles W., Jr.	VIId	" "
Jackson, Charles F.	VIIb	North Andover, "

Name	Course	Address
Johnson, Arthur O.	IVa	Lawrence, Mass.
Kearney, Joseph W.	VIa	Lowell, "
Kelley, Joseph P.	VIb	" "
Kent, Arthur	VIa - VIb	" "
Kirkpatrick, Albert A.	IIIa	" "
LaPrise, Frank E.	IVa	" "
Leary, Charles J.	VIa	" "
Leather, Seward S.	IIb	Methuen, "
Lees, William H.	IIIa	Lowell, "
Leland, Raymond C.	VIb	" "
Luce, Harry A.	IIIa	" "
Lunan, Karl S.	VIa	" "
McAleer, James F.	VIa	" "
McCann, Frank J.	VIb	" "
McCarthy, Charles J.	VIb	" "
McCarthy, Joseph C.	IVa	Lawrence, "
McCartin, Marietta L.	IIIa	Lowell, "
McElroy, Claude R.	VIb	" "
McGee, David	IVa	" "
McKittrick, Percy A.	VIa	" "
Marsden, Fred	IIIa	Lawrence, "
Martin, Charles A.	VIa	" "
Mears, Lewis N.	IVa	Ballardvale, "
Meehan, William F.	VIb	Lowell, "
Moir, Malcolm A.	IIb	" "
Mullen, Frank J.	VIb	" "
Naud, Mary A.	IIIb	" "
†Naylor, Charles	IVc	" "
Norrman, Axel E.	IIa	Hyde Park, "
O'Neil, Walter E.	VIb	North Chelmsford, "
Page, Samuel T.	VIa	Lowell, "
Parker, Elmer H.	VIb	Lawrence, "
Pinkham, Banford O.	VIb	Andover, "
Playdon, Louis C.	Ia	Lawrence, "
Plumer, Paul T.	IIIa	Lowell, "
Porter, William E.	VIa	" "
Potter, Allan B.	VIb	" "
Prescott, Everett H.	VIa	" "
Quinlan, Paul A.	IIIb	" "
Quinn, John A.	VIa	" "
Rice, Henry H.	Ia	" "
Riley, George W.	IVb	" "
Rogers, John T.	VIa	" "
Scully, Patrick F.	IIIa	" "
Smith, Mae T. V.	IIIb	" "
Smith, Miles H.	IIb	Lawrence, "
Stahl, Milton C.	IIb	" "
Stokham, Ernest F.	IVa	Lowell, "
Sullivan, Augustine	VIa	Andover, "
Swanson, Victor E.	IVb	Lowell, "
Swift, John W.	IIb	" "
Tait, James	IIIa	South Lawrence, "
Taft, Joseph C.	VIa	Lowell, "
Twomey, Hugh	VIb	" "
Walker, John J.	VIb	Andover, "
Wallis, Joseph	VIb	Lowell, "

† Deceased

Name	Course	Address
Weeks, Duncan A.	VIb	Lowell, Mass.
Weinhold, William F.	IIIa	Methuen, "
Whitley, Arthur M.	IIb	Lowell, "
Wilder, Ralph S.	IIIa	Lawrence, "
Wilfore, John E.	VIb	Lowell, "
Winslow, Warren A.	IIb	Ayer, "
Woods, Joseph	IIIa	Lowell, "

First Year

Adams, Tracy A.	IIb	Lawrence, Mass.
Allen, William J.	IVb	" "
Allton, Donald H.	IVa	Nashua, N. H.
Anderson, Eugene H.	VIb	Lowell, Mass.
Anderson, William T.	IIIa	" "
Anderton, Harry	Va	" "
Arabian, Nishan	IVa	Lawrence, "
Arms, Richard P.	VIa	Lowell, "
Arnfield, Alfred E.	VIb	Lawrence, "
Arnold, Oscar W., Jr.	IIIa	" "
Ashton, Howard B.	VIb	Lowell, "
Atherton, John	Vb	" "
Atkinson, Reginald	IVb	" "
Auger, Edward A.	IVa	" "
Ayotte, Donat	Ib	" "
Bailey, James E., Jr.	IIIb	" "
Baker, William J.	IVa	" "
Bakewell, Albert	Vb	" "
Bamber, William E.	VIa	" "
Bannister, Frank	VIa	" "
Barnes, Hammond	Va	" "
Barson, Charles F.	Va	" "
Bastow, Stephen W.	Ib	Wakefield, "
Bateman, John H.	IVa	Lawrence, "
Becht, Oscar C.	VIa	Lowell, "
Beers, Norman L.	Vb	Lawrence, "
Belanger, Joseph A. O.	VIa	Lowell, "
Bell, Charles W.	VIe	" "
Bent, Gordon D.	VIa	" "
Bergeron, Ernest	Ib	" "
Black, Alexander S.	IIIa	Lawrence, "
Blomgren, Sigurd W.	VIb	Lowell, "
Bonney, Nathaniel H.	IVa	Lawrence, "
Boone, Henry E.	VIa	" "
Bourgeault, Eugene N.	Ia	Lowell, "
Bourgeault, Joseph M.	Ia	" "
Bourgeault, Joseph W.	VIa	" "
Bowen, Allyn F.	Ia	" "
Bowers, Duncan V., Jr.	VIa	" "
Boyle, John E.	Va	" "
Bradford, Roy H.	VIb	Andover, "
Brandy, William F.	IIa	Lawrence, "
Brearley, Earl B.	VIe	Lowell, "
Bright, Harry	IIb	Lawrence, "
Broughton, Frederick	IIb	" "
Brown, Robert E.	IIb	" "
Brown, William	IVa	Lowell, "

Name	Course	Address
Buey, George E.	VIa	Lowell, Mass.
Bunting, George T.	IIb	Methuen, "
Burke, Frank J.	IIIa-Va	Lowell, "
Burns, Richard L.	VIa	" "
Caldwell, James	VIb	Andover, "
Callahan, Frank W.	VIa-VIb	Lowell, "
Cameron, George W.	IVa	Lawrence, "
Campbell, George J.	VIb	Lowell, "
Campbell, Thomas J.	IIIa	" "
Cardell, Roswell E.	IVa	" "
Carey, William H.	VIb	" "
Carnathan, Alexander T.	VIb	Andover, "
Carter, Raymond	Vb	Lawrence, "
Casavant, Elphege H.	VIa-VIb	" "
Charbonneau, Marie A.	IIIb	Lowell, "
Charlton, Henry F.	VIb	Graniteville, "
Charleton, Peter	IVa	Lowell, "
Chase, Charles A.	VII	" "
Cheetham, James A.	VIa	" "
Chevalier, Edward	IIIb	" "
Choquette, Napoleon	IIIa	" "
Clark, Thomas T.	IVc	North Billerica, "
Clough, Herschel G.	IVa	Lowell, "
Coan, Albert	VIa	" "
Coan, Frederick A.	Va	" "
Coburn, Charles	IVa	" "
Coburn, Walter F.	VIb	" "
Cochrane, John	IVa	" "
Confield, William J.	IVa	" "
Conley, Leander F., Jr.	Ia	" "
Connors, John	Ia	" "
Considine, Agnes L.	IIIb	" "
Corbett, William	VIb	" "
Courtney, Roy F.	VIa	" "
Crabtree, Joseph	VIa	Lawrence, "
Crandall, Stanley M.	VIe	Lowell, "
Crawford, Robert M.	VIa	" "
Crompton, George E.	IVa	" "
Crumbie, Charles	IIb	" "
Cudworth, Joseph	VIb	" "
Currul, Albert	VIb	" "
Dame, Percy M.	IVa	" "
Danckert, James H.	IIa-VII	" "
Dancosse, Armand J.	VIa	" "
Daskalakis, Efthimios Z.	IIIa	" "
Davidson, William L.	IVa	" "
Davis, Arthur	VIa	" "
Davis, George A.	IIb-IIIa	Boston, "
Davis, Harry A.	IVa	Ayer, "
Dawson, Walter F.	VIa	Lowell, "
Deady, William F.	VIe	" "
Delderfield, William	Vc	" "
Desallier, Adolphe J.	VIb	" "
Dewhurst, Thomas	IVa	Methuen, "
Dickson, Earl E.	VIa	Lowell, "
Dion, Ovila	VIa	" "
Dionne, Charles A.	VIa	" "

Name	Course	Address
Dionne, Ludger	VIa	Lowell, Mass.
Dixon, William	VII	Methuen, "
Doherty, Robert	VIa	Lowell, "
Donahue, Francis P.	Ia	" "
Donnelly, John	Vb	" "
Donovan, William A.	IIB	Lawrence, "
Doole, John T.	IVb	Lowell, "
Doray, Alfred	Va	" "
Douglas, Raymond E.	Ib	" "
Downing, Esther M.	Ia	" "
Dresios, Euphemios R.	IIIB	" "
Dubois, Arthur	VIa	" "
Dubois, Ubald E.	VIB	" "
Ducharme, Wilfrid	VIa	" "
Duffy, Francis V.	VIB	" "
Dugan, Peter J.	VIB	Andover, "
Dupont, Wilfrid	VIa	Lowell, "
Dureault, Joseph A.	IIIA	Westford, "
Early, William E.	VIa	Lowell, "
Ecclestone, Arthur G.	VIa	" "
Emond, Florian	Vb	" "
Emond, Wilfred	VIa	" "
Erickson, Arthur W.	VIa	" "
Eveleth, Paul H.	VII	" "
Faneuf, George J.	VIa	" "
Favreau, Alberic J.	VIa	" "
Favreau, Peter C.	VIa	" "
Fernley, Bert L.	VId	" "
Finn, David A.	IIIB	Lawrence, "
Fitzgerald, Thomas J.	Ia	Lowell, "
Fleming, Joseph A.	IVa	" "
Fletcher, Robert	Va	" "
Flynn, Walter S.	VIB	" "
Flynn, William	VIa	" "
Foggan, John	Va	" "
Fraser, Robert	VIa	Lawrence, "
French, Walter B.	VIa	Lowell, "
Frothingham, William A.	VII	" "
Fullen, Hugh	Ib	" "
Fuller, Edwin M.	Ia	" "
Furey, William J.	VIa	" "
Gagnon, Arthur C.	VId	" "
Gagnon, Joseph B. E.	VIa	" "
Gagnon, Leo	VIB	" "
Gagnon, Peter P.	VIa	" "
Gale, Harold M.	VIa	" "
Gallagher, Charles L.	VIa	" "
Gardiner, John P.	Ia	Brookline, "
Gaudette, Eugene O.	VIa-VIe	Lowell, "
Gaulin, Achille G.	VIB	" "
Gearin, George E.	VIB	" "
Gelineau, Charles A.	VIB	" "
Gelineau, George A.	VIB	" "
Gendreau, Edward	VIa	" "
Gendron, Silvio A.	VIa	" "
Gerry, Churchill	VIa	" "
Gervais, Oscar	VIa	" "

Name	Course	Address
Gibbons, Joseph P.	VIb	Lawrence, Mass.
Giffin, Charles H.	VII	Lowell, "
Giffin, George R.	VII	" "
Gile, Harold E.	IVb	Lawrence, "
Gill, Homer	VIa	Lowell, "
Gill, Peter	Va	" "
Gilmore, Hazel S.	IIIb	" "
Girardeau, Philippe P.	VIa	" "
Giroux, Leo R.	VIa	" "
Goodell, Josiah B.	IVa	" "
Gore, Frederick M.	VIa	" "
Grant, Royal E.	VIa-VIb	" "
Green, Robert J.	VIe	" "
Greene, Thomas A.	VIa	" "
Greenhalgh, Stanley A.	VIa	Lawrence, "
Greer, Robert	IIb	Lowell, "
Gregg, Albert J.	Va	" "
Gustafson, Alfred L.	VIe	" "
Hackett, Thomas	Vb	" "
Haldane, Andrew	Va	Lawrence, "
Hale, Frank O.	Ia	Lowell, "
Hall, Joseph W.	IIIb	" "
Hall, Richard G.	Ia	" "
Halloran, Joseph M.	IVa	" "
Hamill, James J.	VIb	" "
Hamilton, William J.	Ia	" "
Hammond, John N.	Vb	North Andover, "
Hannagan, Edward F.	VII	Lawrence, "
Harris, George W.	IIIa	" "
Hartley, Fred	IIIa	Lowell, "
Hartnett, Michael J.	IVa	Lawrence, "
Hartt, Kenneth R.	VIb	Lowell, "
Hartwig, Albert E.	Vb	Lawrence, "
Hayman, Henry	IVa	North Andover, "
Healy, Andrew J.	VIb	Lowell, "
Heath, Thomas A.	VIb	" "
Hebert, Joseph E.	VIa	" "
Heiser, Jerome M.	IIIa	" "
Hendry, John	IIIa	Lawrence, "
Henning, Fred A.	Vb	" "
Henry, Vernard I.	IIIa	Lowell, "
Herbst, Gustav F.	Ia-Va	" "
Hersom, Fred E., Jr.	VIb	Lawrence, "
Hill, Frank E.	IVa	" "
Hill, Paul	VII	" "
Hogan, David D.	VIb	Lowell, "
Hogertt, Walter J.	Va	" "
Holden, William H.	VIa	" "
Hollis, William	VII	North Billerica, "
Holt, Justin G.	Ia	Lowell, "
Hopwood, Charles	Ia	" "
Hoyle, Edward	IIIa	" "
Howard, Herbert J.	VIb	" "
Howker, John	Va	" "
Hunnewell, Myron T.	Ia	" "
Hunt, Aubrey L.	IVa-VIa	" "
Inglis, Thomas F.	VIa	" "

Name	Course	Address
Jacklin, Thomas J.	VII	Lawrence, Mass.
Jackson, Walter J.	Vb	" "
Jeffrey, Arthur E.	IIb	Methuen, "
Jenkins, Harry E.	IVa-VIe	Lowell, "
Jessop, Charles C.	IVa	" "
Johnson, Alfred N.	VIb	" "
Johnson, Guy I.	Ia	" "
Johnson, Maurice	VIa	" "
Jordan, Frederic W.	VIe	" "
Jordan, Marguerite	IIIb	" "
Judge, Homer	IIIb	Andover, "
Kane, Michael H.	VIa	Lowell, "
Kane, William L.	VIa	" "
Katis, Stairos K.	IIIb	" "
Keleher, Edward A.	Ia	" "
Keleher, John L.	VID	" "
Kelley, George H.	VIa	" "
Kenyon, Herbert	Ia	" "
Kerrigan, Arthur J.	VIe	" "
Kerrigan, Herbert T.	VIb	" "
Kirk, William C.	VIa	" "
Kirsch, William	VIa	Lawrence, "
Knight, Thomas J.	VIa	Lowell, "
Lafontaine, Edward	VIa	" "
Landry, Arthur	Ia	" "
Lane, Lewis A. D.	VIa	Lawrence, "
Langevin, George F.	VIa-VIe	Lowell, "
Lannan, Joseph D., Jr.	VID-VIe	" "
Laporte, Elsie	IIIb	" "
L'Archer, Eugene J.	VIa	Andover, "
Larkin, James T.	VID	Lowell, "
Larue, Marie I.	IIIb	" "
LaVigne, Andre J.	VIb	" "
Lawrence, Abbott	VID	" "
Learned, Frank E.	Vc	Methuen, "
Leary, Charles J.	VIa	Lowell, "
Leavitt, John F.	VIa	" "
Lee, Fitzhugh	IIIa	Lawrence, "
Leighton, John L.	VII	" "
Leighton, Thomas F.	VIa	Lowell, "
Leinhas, William F.	VIb	" "
Lemay, Edward G.	Ib	" "
Lemire, Hermanne	VIa	" "
Lemire, Zenon J.	Ia	" "
Leonard, Charles W.	IIa	" "
L'Esperance, Walter J.	IVa	" "
Linehan, Thomas W.	VII	Lawrence, "
Looby, George A.	Vc	Lowell, "
Low, James	VIa	Andover, "
Lowe, Harry F.	Vb	Lowell, "
Luce, Harry A.	VII	" "
Lunan, Karl S.	VIa-VIe	" "
Lund, Stanley W.	VIb	Lawrence, "
Lussier, Hidalla	VIa	Lowell, "
Lynch, Thomas E.	Va	" "
Lyons, Leo L.	VIa	" "
McCarty, William	IIIa	North Andover, "

Name	Course	Address
McCartin, Marietta L.	IIIb	Lowell, Mass.
McCormack, Dollie E.	IIIa	Forge Village, "
McCreery, Robert W.	Ia	Lowell, "
McDermott, James C.	VIIb	" "
McDermott, Nelson J.	VIa	" "
McDermott, Thomas R.	IVa	" "
MacDonald, John F.	Ia-Va	Woburn, "
McGaunn, Charles	VId	Lowell, "
McGaunn, Theodore	VId	" "
McGee, David	IVc	" "
McGirl, Robert	VIa	" "
McGowan, Annie C.	IIIa	" "
McGurn, Francis	VIa	" "
McHugh, Edward J.	VIa	" "
McIntosh, Samuel C.	IIIa	" "
MacKenney, Harold E.	VIa	" "
McKnight, William H.	VId	" "
McKone, Peter J.	VIIb	" "
McLaughlin, Laurence H.	VIa	" "
MacLeod, Charles E.	VIa	" "
McQuade, Thomas H.	VId	" "
McQuade, William J.	VId	" "
McQuesten, John T.	IVa	" "
Magee, Chester F.	VIa	" "
Maguire, Frank E.	VIa	" "
Mahoney, Joseph	Vc	" "
Marsh, John	VIIb	" "
Marshall, Arthur S.	VIa	" "
Marshall, Frank S.	VIa	" "
Marshall, William E.	VId	" "
Marquis, Noe I.	Ib	" "
Martin, Ernest M.	Vb	Lawrence, "
Matthews, Thomas E.	VIIb	" "
Maxwell, William A.	VIa	Lowell, "
Mercier, Ernest A.	IIIb	" "
Merrill, Lester C.	VIIb	" "
Merry, Ross	Vb	Lawrence, "
Messer, Raymond B.	VIa	Lowell, "
Metcalfe, Sydney C.	VIIb	Methuen, "
Meyers, Charles J.	Ia	Lowell, "
Milot, Aram A.	IVa-Vb	" "
Miyoshi, Kanae	IIIa	Boston, "
Molloy, Michael A.	VIa	Lowell, "
Moloney, John F.	IVa	Lawrence, "
Monahan, Thomas F.	VIa	Lowell, "
Moran, William	IVa	" "
Mosher, Chester L.	VIIb	" "
Moss, Joseph	Ia	" "
Mountain, Everett R.	Ia	" "
Mouradian, Leo	IIIb	" "
Mungan, George F.	IIb	" "
Murphy, Christopher	IIIb	" "
Murphy, Robert E.	VIa	" "
Murphy, William H.	VIc	" "
Murray, Walter J.	VIa	" "
Nahigian, John S.	Vb	" "
Neckou, Demetrios	IVa	" "

Name	Course	Address
Neel, Andrew, Jr.	IVa	Lawrence, Mass.
Nicoll, Claude	VIId	Andover, "
Nicoll, James K.	VIId	" "
Norris, Henry A.	VIa	Lowell, "
Nurczyk, Frank	VIe	" "
O'Brien, John A.	VIb	" "
O'Brien, Philip F.	IVa	" "
O'Brien, Raymond L.	IVa	Lawrence, "
Obst, Ehrich	VIId	Methuen, "
O'Connor, Frank H.	Ia	Lowell, "
Ogden, Frank	IIIa	" "
Ohlson, Albert L.	VIId	" "
O'Reilly, Bernard J.	Ia	" "
Orr, William J.	IIIa	Andover, "
Overton, James	IIIa	Lowell, "
Owen, Frederick	IVa	" "
Page, Samuel T.	VIa	" "
Palm, Olive J.	IIIb	" "
Paquette, Joseph F. B.	VIa	" "
Parker, George A.	IVa	" "
Parker, John G.	Va	" "
Patrick, John	VIa	" "
Payette, Laura	IIIb	" "
Pedler, William A.	Ib	Methuen, "
Pendlebury, David	Ia	Lawrence, "
Pendlebury, Harold	VIId	" "
Pepin, Wilhelm R.	IIIb	Lowell, "
Perron, Francis J.	IIIa	North Andover, "
Pickles, Wilfrid	Va	Lawrence, "
Pierce, Duncan H.	VII	Lowell, "
Pierce, Gordon J.	Vb	" "
Playdon, Roy A.	IIb	Lawrence, "
Poore, Ralph C.	Ia	" "
Porter, William E.	VIId	Lowell, "
Potter, Robert	VIe	" "
Pratte, Jeannette I.	IIIb	" "
Preble, George	IVa	" "
Prior, Samuel W.	IVa	Lawrence, "
Protopappas, Taxiarchis T.	IIIb	Lowell, "
Quinn, John A.	VIa	" "
Quinn, Leo E.	VIe	" "
Racicot, Marie E.	IIIa	" "
Ralls, Myles F.	VIa	" "
Redman, Henry S.	VIe	" "
Redpath, Robert H.	Vb	Lawrence, "
Reid, John H.	VIa	Lowell, "
Renaud, Lillian	IIIa	" "
Rhodes, William H.	IIIa	Lawrence, "
Richard, Joseph M.	VIa	" "
Richardson, James	VIb	Lowell, "
Richmond, Lysánder	VIe	" "
Riley, James J.	IIIa	" "
Rivard, George	Ia	" "
Roarke, Thomas H.	VIa	" "
Rocha, Frank	Va	" "
Rodger, William	VII	Lawrence, "
Rodrick, Raymond	Vb	Lowell, "

Name	Course	Address
Rogers, Edmund D.	IVa	Lowell, Mass.
Rogers, Peter H.	IIIa	" "
St. Hilaire, Leo A.	VIa	" "
Sauermann, Henry A.	Vb	Lawrence, "
Sawers, James	Va	Lowell, "
Scales, Albert F.	Vc	" "
Schmidt, Hartman F.	VII	Lawrence, "
Schofield, Michael J.	VIIb	" "
Scully, John F.	VIa	Lowell, "
Sehlstedt, Gustaf	VIIb	" "
Seton, William W.	VIa	" "
Seymour, Charles	IIIb	" "
Shaw, Leo B.	IVa	" "
Shaw, Stanley	VIIb	" "
Shearer, David D., Jr.	IIIa	Lawrence, "
Shepard, Frederick E.	Vb	Lowell, "
Shepherd, Prentiss	IIIa	" "
Shields, George M.	Va	" "
Silva, Tony	Va	" "
Simard, Agnes	IIIb	" "
Smith, Ernest	Va	" "
Smith, Joseph	VIIb	" "
Smith, Rothwell E.	VIc	" "
Smith, Thomas	Va	" "
Smith, Tom	IIb	Methuen, "
Smith, Walter M.	IVa	Lowell, "
Snickers, Eugene	Ia	" "
Sorenson, David P.	IIIa	Dracut, "
Soule, William N.	VIa	Lowell, "
Spillane, Marie	IIIb	" "
Stanley, John R.	Vb	North Chelmsford, "
Steere, Samuel A.	Va	Lowell, "
Stewart, Alexander W.	VIIb	Andover, "
Stewart, George	Va	Lowell, "
Stone, Vahnos V.	VIIb	Tyngsboro, "
Strandberg, Harry O.	IIIb	Lowell, "
Streeter, Lisle B.	VIIb	" "
Sturtevant, Herbert A.	Ia	" "
Sugden, Albert G.	IIIb-IVa	" "
Sullivan, Joseph	IIIa	" "
Sullivan, William	Vb	" "
Summersby, William C.	Ia	" "
Swain, Robert F.	VIIb	North Chelmsford, "
Swapp, Andrew F.	VIa	Lowell, "
Swift, William	VIIb	" "
Sykes, Richard O., Jr.	IIb	" "
Tabor, Thomas R.	VIa	" "
Takahashi, Gentaro	IIIa	Boston, "
Tarren, William	IIb	Methuen, "
Tatlon, James H.	IIb	Lawrence, "
Taylor, Charles E.	VIc	Lowell, "
Taylor, James H.	Vb	" "
Temple, Frank L.	VIa	" "
Thomas, Cyril	IIb	Methuen, "
Tivey, Harold E.	IVa	North Billerica, "
Tobin, Walter J.	VIa	Lawrence, "
Tougas, Homer	VIIb	Lowell, "

Name	Course	Address
Toupin, Charles H.	IVa	Lowell, Mass.
Townsend, Solon F.	VIb	" "
Trees, Harry J.	VIb	Lawrence, "
Tucke, Edward D., Jr.	VIa	Lowell, "
Turgeon, Roderick	IVc	" "
Tweed, John H.	VIb	" "
Ujueta, Arnaldo	IVa	" "
Underhill, Karl B.	VIa	Nashua, N. H.
Underwood, George T.	VIa	Lowell, Mass.
Underwood, Leslie H.	VIa	" "
Vancour, Herbert J.	IVa	" "
Veiga, Manuel	VIa	" "
Verfaillie, Alfred	VIa	Lawrence, "
Verville, Ernest	Ia	Lowell, "
Wagner, Alfred J.	IIIa	" "
Wainwright, Harold	IVb	Lawrence, "
Waldron, Harold J.	IIIa	" "
Walton, James A.	VIb	Lowell, "
Ward, Lester J.	VIb	" "
Watson, Luther F.	VIb	Lawrence, "
Webster, Orrin H.	Va	Lowell, "
Weeks, Duncan A.	Ia	" "
Welch, Albert W.	Vb	" "
Welton, Clarence	Ia	" "
Whitaker, Alfred T.	IVa	" "
Whiteoak, Percy	IIB	" "
Wiesberg, Harry	VIb	Lawrence, "
Wiggins, John R.	Vb	Lowell, "
Wilde, Herman E.	IVa	Lawrence, "
Wilfore, John E.	VIb	Lowell, "
Wilkinson, James J.	VIb-VIb	Methuen, "
Wilkinson, William L.	IIIa	North Andover, "
Williams, Alfred	IIB	Methuen, "
Wilson, Arthur K.	IVa	Lowell, "
Woessner, Ernest F.	Ib	" "
Wood, Earl	VIa	" "
Wood, Samuel J.	Ia	" "
Wood, William H.	IVa	Lawrence, "
Woodbury, Eugene P.	VII	" "
Woods, Harvey A.	IVa	Lowell, "
Woods, Joseph	IIIa	" "
Wray, James R.	VIb	Methuen, "
Wright, John E.	IVa	Reading, "
Young, Fred L.	VIb	Lowell, "
Younger, Andrew	VII	" "
Zimmer, George D.	IVa	" "

SUMMARY

Day Students	123
Evening Students	694
Total	817
Names Counted Twice	59

758

ALPHABETICAL LIST OF GRADUATES

Name	Course	Class	Day or Evening
Abbott, Arthur G.	Vb	1913	E
Abbott, Edward M.	II	1904	D
Abbott, George R.	II	1908	D
Abbott, Paul W.	Ia	1906	E
Ackroyd, Theodore C.	IIb	1907	E
Adams, Henry S.	IIa	1903	E
Adams, Henry S.	I	1905	D
Adams, Michael E.	VI	1904	E
Adams, Tracy A.	IV	1911	D
Adams, William R.	IIa	1902	E
Allen, William J.	IVa	1913	E
Amiot, Louis H.	Va	1906	E
Anderson, Carl A.	IV	1909	E
Anderton, Harry	Va	1910	E
Anderton, Harry	Vb	1913	E
Andrews, Oliver	Ia-Va	1911	E
Arienti, Peter J.	IV	1910	D
Armstrong, Elias B.	IIb	1906	E
Arnold, Warren H.	VII	1908	E
Arnold, Warren H.	IIIa	1909	E
Arundale, Henry B.	II-III-V	1905	D
Arundale, Henry B.	II	1907	D
Aspinwall, William	IIb	1901	E
Atkinson, Norman	Vb	1910	E
Atkinson, Reginald C.	IVa	1913	E
*Avery, Charles H.	II	1906	D
Bailey, Carl E.	Ia	1910	E
Bailey, Joseph W.	I	1899	D
Bailey, Rothwell	Va	1909	E
Bailey, Walter J.	IV	1911	D
Bain, William A.	VII	1907	E
Bake, Herbert	IIIa	1905	E
Bake, Herbert	P. G. IIIa	1906	E
Bake, Herbert	VII	1907	E
Bake, Herbert	P. G. IIIa	1909	E
Baldwin, Arthur L.	IV	1900	D
Baldwin, Frederick A.	II	1904	D
Ballard, Horace W. C. S.	IV	1908	D
Ballinger, Frederick W.	IIb	1907	E
Ballinger, William E.	IIb	1911	E
Balmforth, James H.	IIa	1903	E
Balmforth, James H.	IIa-b	1904	E
Balmforth, William F.	VI	1904	E
Balmforth, Martha B. (See French)			
Banks, Jonas	Va	1909	E
Banks, Jonas	Vc	1910	E
Barber, James E.	IIb	1907	E
Barker, John P.	V	1904	E
Barlow, Robert	V	1902	E
Barnes, Joseph	Ia	1911	E
Barr, Elizabeth Butler	IIIb	1909	E
Barr, I. Walwin	I	1900	D
Barracrough, John C.	Ia	1907	E
Barrington, James L.	IV	1908	E

*Deceased

Name	Course	Class	Day or Evening
Barrington, John A.	IV	1904	E
Barry, Edward J.	IIIa	1903	E
Bassett, Cyrus J.	Vb	1913	E
Bastow, Henry	IIIa	1903	E
Bastow, Henry	V	1905	E
Bastow, Percy	IVa	1911	E
Bastow, Stephen W.	IV	1907	E
Baxter, Alvah J.	IIa	1903	E
Bayard, Pierre P.	IIIa	1907	E
Beaulieu, William E.	IIb	1913	E
Beech, Wilfred	Ia	1912	E
Begen, Thomas W.	IIb	1907	E
Begen, Thomas W.	IIb	1908	E
Bell, Charles W.	VIa	1913	E
Bell, Frederick W.	IIa	1905	E
Bennett, Edward H.	V	1903	D
Bennett, Herbert B.	II	1913	D
Benoit, Benjamin L.	VIb	1909	E
Benoit, William A.	Va	1907	E
Bernard, Joseph E.	VIa	1912	E
Berry, Alfred H.	VI	1908	E
*Berry, Frank M.	IIIa	1899	E
*Berry, Frank M.	V	1901	E
Berry, Percy W.	Vb	1910	E
Bigelow, Prescott F.	II	1912	D
Binns, Heaton	II-V	1899	E
Binns, Heaton	VI	1902	E
Birkby, Charles H.	IVa	1911	E
Black, Alexander S.	Vb	1913	E
Blaikie, Howard M.	II	1911	D
Blais, Emile	VIa	1912	E
Blanchette, Eugene	IIIb	1912	E
Bloom, Wilfred N.	IV	1903	D
Bodwell, Henry A.	II	1900	D
Boije, Walter F.	IIb-VII	1912	E
Booth, Arthur	IIIa	1909	E
Boucher, John L.	VI	1904	E
Bouille, Arthur L.	Vb	1907	E
Bourchard, Ethan J.	Vc	1910	E
Bourchard, Robert R.	Vb	1910	E
Bowen, Herbert E.	IIIa	1909	E
Bowie, Samuel A.	VI	1905	E
Bowring, George P. B.	VI	1902	E
Boyd, George A.	I	1905	D
Bradford, Roy H.	II	1906	D
Bradley, Richard H.	V	1901	D
Brainerd, Albert C.	Ia	1912	E
Brainerd, Arthur T.	IV	1909	D
Brainerd, Harry C.	Ia	1912	E
Brainerd, Irving L.	Ia	1902	E
Bramley, Charles	Va	1912	E
Brannen, Leon V.	III-V	1907	D
Brannen, Leon V.	IIa	1907	E
Breen, James D.	Vc	1913	E
Breen, John P.	Vb	1913	E
Brickett, Chauncey J.	II	1900	D

*Deceased

Name	Course	Class	Day or Evening
Broadbent, James H.	Vb	1908	E
Broadbent, James T.	Ia	1899	E
Broadbent, William	Vb	1908	E
Broderick, Thomas H.	VII	1912	E
Brooks, Noah	IIIa-V	1901	E
Brouder, John J.	IIIa	1906	E
Brouder, John J.	VII	1907	E
Brown, James P.	IIIa	1905	E
Brown, James P.	P. G. IIIa	1906	E
Brown, James T.	IIIa	1908	E
Brown, Rollins	IV	1912	D
Brown, William F.	VIIb	1911	E
Brown, William G.	IIb	1906	E
Browne, Charles D.	Ia	1912	E
Bryant, Ernest L.	VI	1905	E
Buchan, Donald C.	II	1901	D
Buckley, Harry	IV	1908	E
Buckley, Richard A.	Vb	1909	E
Bucklitsch, Gustave J.	IIb	1907	E
Bunce, Raymond H.	Vb	1909	E
Burgess, Joseph H.	Va	1906	E
Burgess, Joseph H.	Vb	1907	E
Burgess, Joseph H.	IIIa	1910	E
Burghardt, Edward S.	IIa	1902	E
Burghardt, Paul C.	IIa	1901	E
Burke, George J.	VII	1912	E
Burke, James F.	Vc	1911	E
Burke, Thomas F.	Ia	1905	E
Burnham, Frank E.	IV	1902	D
Burnham, Joseph W.	IIIa	1906	E
Burnham, Wilmont V.	Vb	1906	E
Burns, Edward J.	IV	1905	E
Burns, James E.	IV	1905	E
Burrage, Katherine C.	IIIb	1899	D
Burrage, Katherine C.	P. G. IIIb	1900	D
Butland, Ralph A.	VII	1913	E
Butler, Benjamin O.	VI	1904	E
Butler, Elizabeth M. (See Barr)			
Butterworth, Charles A.	Va	1907	E
Butterworth, John A.	IIb	1907	E
Buzzell, Fred S.	IIIa	1912	E
Buzzell, Fred S.	VII	1913	E
Buzzell, William O.	IIIa	1901	E
Buzzell, William O.	P. G. IIIa	1902	E
Byam, Walter S.	VI	1903	E
Cady, Dennis J.	V	1903	E
Callahan, Patrick A.	VI	1904	E
Cameron, Elliott F.	IV	1911	D
Campbell, Albert D.	IIb	1900	E
Campbell, Archibald	IV	1908	E
Campbell, Edward G.	VIc	1910	E
Campbell, Laura E.	IIIb	1900	D
Campbell, Louise P.	IIIb	1903	D
Campbell, Orison S.	II	1903	D
Carden, Francis E.	IIb	1907	E
Carden, Francis E.	IIb	1908	E

Name	Course	Class	Day or Evening
Carlson, Ernest B.	IIb	1907	E
Carlson, Goddard O.	VII	1912	E
Carman, William	Va	1909	E
Carney, William J.	Ia	1908	E
Caron, Cleophas	Ia	1905	E
Carpilio, John A.	VIa	1911	E
Carr, George E.	I	1905	D
Carter, Charles R.	Vb	1908	E
Carter, Robert A.	IV	1902	D
Carty, Thomas P.	Vb	1911	E
Cary, Julian C.	VI	1910	D
Cawthra, Albert B.	IIb	1900	E
Chamberlin, Frederick E.	I	1903	D
Chandler, Proctor R.	IV	1911	D
Charleton, Peter	VIa	1913	E
Cheetham, John James	IIIa	1901	E
Cheetham, John James	P. G. IIIa	1902	E
Cheetham, John Joseph	Ia	1904	E
Chesworth, Frank K.	Va	1909	E
Chippindale, Ernest W.	IIb	1901	E
Chisholm, Lester B.	I	1911	D
Christenson, John O.	VIIb	1912	E
Christison, Hugh	IV	1910	E
Christison, Hugh	IVd	1911	E
Church, Charles R.	II-V	1906	D
Churchill, Charles W.	III	1906	D
Clapp, F. Austin	II	1904	D
Clark, John W.	IVa	1912	E
Clark, Thomas T.	II	1910	D
Clarke, Wesley J.	VId	1913	E
Classon, Walter H.	Vc	1913	E
Cleary, Charles J.	II	1913	D
Clogston, Raymond B.	IV	1904	D
Coan, Charles B.	IV	1912	D
Cochrane, John	VIIb	1911	E
Cockell, Frederick H.	IIIa	1909	E
Colby, Arthur D.	Ia	1900	E
Cole, Edward E.	IV	1906	D
Cole, James T.	II	1905	D
Collier, John	IIIa	1899	E
Collier, John	P. G. IIIa	1902	E
Collins, John A.	IIa-b	1905	E
Coman, James G.	I	1907	D
Conant, Harold W.	I	1909	D
Conant, Richard G.	I	1912	D
Conklin, Jennie G.	IIIb	1905	D
Conley, Frederick A.	VI	1904	E
Connors, Edward F.	VI	1904	E
Cook, Cheney E.	IIIa	1905	E
Cook, Kenneth B.	I	1913	D
Corr, Eben W.	Vb	1908	E
Corr, James F.	Vb	1908	E
Cote, Fred J.	VIa	1913	E
Cote, George W.	VIIb	1911	E
Cowdell, Herbert	V	1901	E
Cowdrey, Charles E.	V	1902	E

Name	Course	Class	Day or Evening
Cowdrey, Charles E.	Vb	1909	E
Cox, Edward J.	IIIa	1910	E
Cox, Edward J.	Va	1911	E
Cox, Edward J.	Ia	1913	E
Craig, Albert W.	IV	1907	D
Craig, Clarence E.	III	1902	D
Craven, Harry	VII	1908	E
Cremin, Daniel J.	Ia	1902	E
Crompton, Henry H.	II	1899	E
Cudmore, Edward T.	VId	1913	E
Culver, Ralph F.	IV	1904	D
Curran, Charles E.	II-III-V	1902	D
Currier, Herbert A.	I	1906	D
Currier, John A.	II	1901	D
Curtis, Frank M.	I	1906	D
Curtis, William L.	II	1905	D
Cushing, Lester H.	Ia	1913	E
Custer, James J. E.	V	1905	E
Cutler, Benjamin W., Jr.	III	1904	D
Cutress, Albert J.	VId	1910	E
Cuttle, James H.	II	1899	D
Dalton, Gregory S.	IV	1912	D
Dana, Clarence A.	VI	1905	E
Daskalakis, Efthimios Z.	Vb	1912	E
Daskalakis, Efthimios Z.	Vc	1913	E
Davieau, Arthur N.	VI	1913	D
Davis, Alexander D.	VI	1913	D
*Davis, Henry	IIb	1901	E
Davis, Prentice T.	Ia	1904	E
Davison, Frank L.	Vb	1909	E
Dean, Hubert R.	Vlb	1911	E
Dearborn, Roy	VI	1913	D
Dearth, Elmer E.	IV	1912	D
Deely, John A.	Vb	1910	E
Delaney, Michael J.	Vb	1911	E
Delmage, Edward R.	IIIa	1904	E
Dempsey, John W.	IIa	1904	E
Devine, Mary F.	IVa	1913	E
Dewey, James F.	II	1904	D
Dewey, Maurice W.	II	1911	D
Dick, Henry K.	Ia	1912	E
Dick, Hugo P.	IIIa	1905	E
Dick, Hugo P.	P. G. IIIa	1906	E
Dick, Hugo P.	IIb	1907	E
Dick, Hugo P.	Vb	1908	E
Dickson, Andrew	IIa	1906	E
Dillon, James H.	III	1905	D
*Dimlick, Benjamin C.	IIIa	1905	E
*Dimlick, Benjamin C.	P. G. IIIa	1906	E
Dittman, Ralph A.	IIIa	1912	E
Dixon, Arthur	IIIa	1908	E
Dobbs, William	IIb	1907	E
Dobbs, William	IIb	1908	E
Dodge, Charles P.	IIa	1907	E
Dodge, Ernest W.	Vb	1911	E

*Deceased

Name	Course	Class	Day or Evening
Dodge, Frank	Ia	1906	E
Dollbaum, John A.	IIIa	1912	E
Donahay, William H.	Vb	1912	E
Donahue, Michael F.	VI	1904	E
Donald, Albert E.	II	1904	D
Donnellan, Frank T.	IIa	1902	E
Donnellan, Frank T.	V	1903	E
Donnelly, James	Ia	1900	E
Donovan, Daniel F.	IIa	1901	E
Doole, George L.	VI	1904	E
Dooley, Edward W.	VI	1904	E
Downs, John F.	VId	1911	E
Doyle, John B.	VId	1913	E
Duce, Benjamin	IIIa	1906	E
Duce, Benjamin	VII	1907	E
Duckett, Fred I.	Vb	1910	E
Dudley, George E.	Ia	1902	E
Duggan, Francis P.	VI	1904	E
Dulligan, Charles E.	VIa	1909	E
Dulligan, Charles E.	IVa	1912	E
Dulligan, Lawrence F.	VIa	1910	E
Dulligan, Thomas	VIa	1911	E
Dunn, George C.	IIIa	1908	E
Dunn, George C.	IVa	1910	E
Dunn, George C.	IVb	1913	E
Dunning, Carlos W.	VIIb	1909	E
Duval, Joseph E.	II	1910	D
Dwight, John F., Jr.	II	1908	D
Egan, Charles H.	IVa	1912	E
Ehrenfried, Jacob B.	II-V	1907	D
Ekengren, Hilding C.	IIIb	1913	E
Eklund, Louis V.	Vb	1910	E
Elliot, Gordon B.	II	1912	D
Ellis, George W.	VII	1906	E
Elston, Fred R.	IIIa	1900	E
Emerson, Frank W.	II	1903	D
Engstrom, Karl E.	VI	1912	D
Erbe, Gustave	VI	1905	E
Evans, Alfred W.	III	1903	D
Evans, William R.	III	1903	D
Evison, William A.	V	1901	E
Ewer, Nathaniel T.	IV	1901	D
Eyers, John T.	IV	1906	E
Fairbanks, Almonte H.	II	1909	D
Farmer, Chester J.	IV	1907	D
Farr, Leonard S.	II	1908	D
Farrell, Thomas	IIa	1901	E
Fels, August B.	II	1899	D
Ferguson, Arthur F.	I	1902	D
Ferguson, Arthur F.	I	1903	D
Ferguson, Thomas	V	1902	E
Ferguson, William G.	III	1909	D
Field, Charles W.	VI	1902	E
Fielding, Fred	Vc	1910	E
Finlay, Harry F.	IV	1910	D
Fiske, Starr H.	II	1909	D

Name	Course	Class	Day or Evening
Flaherty, William	Vb	1911	E
Fleming, Frank E.	IV	1906	D
Flemings, Lester A.	Va	1910	E
Fletcher, Roland H.	VI	1910	D
Flint, Leon G.	IIIa	1907	E
Flynn, John	VId	1910	E
Flynn, John J.	VI	1903	E
Flynn, Patrick	Vb	1910	E
Flynn, Thomas P.	IV	1911	D
Flynn, William J.	Vb	1908	E
Ford, Edgar R.	IV	1911	D
Forrest, Fred G.	IIa	1902	E
Forrest, William R.	VId	1913	E
Fortune, David A.	IIb	1902	E
Foster, Clifford E.	II	1901	D
Foster, Sherwood L.	Ia	1905	E
Fournier, Albert A.	Ia	1911	E
Frame, William	V	1901	E
Frank, Emil M.	IIIa	1904	E
Frank, Emil M.	P. G. IIIa	1906	E
Frechette, Alphonse J.	IIb	1907	E
Freeman, George D.	VId	1913	E
Freeman, Ralph W.	IVa	1912	E
French, Ernest J.	Ia	1905	E
French, Martha Balmforth	IIIa	1903	E
Frost, Harold B.	II	1912	D
Frothingham, Newton S.	Ia	1912	E
Fujiyoshi, Heisayu	Ia	1910	E
Fujiyoshi, Heisayu	Va	1911	E
Fuller, George	I	1903	D
Fulton, John M.	V	1906	E
Gadsby, Arthur N.	II	1913	D
Gagan, John H.	V	1901	E
Gahm, George L.	II	1906	D
Gainey, Francis W.	IV	1911	D
Gakidis, Alexander N.	IVa	1911	E
Gale, Harry L.	III	1910	D
Garner, William	IIIa	1903	E
Garrity, Joseph F.	VId	1911	E
Gaspar, Edith E.	IIIb	1910	E
Gaunt, Alfred C.	IIIa	1899	E
Gaunt, Alfred C.	P. G. IIIa	1902	E
Gaunt, Alfred C.	IIa	1903	E
Gaunt, Alfred C.	IIb	1904	E
Gaunt, Ernest H.	IIIa	1909	E
Gauthier, William	Vb	1910	E
Gay, Earle B.	Ia	1905	E
Gay, Olin D.	II	1908	D
Gerrish, Walter	III	1903	D
Giffin, Charles H.	IIIa	1913	E
Giffin, George R.	IIIa	1913	E
Gile, Harold E.	IVa	1913	E
Gilinson, Philip J.	VIa	1909	E
Gillispie, James E.	VII	1907	E
Gillon, Sarah A.	IIIb	1906	D
Glennon, Edward M.	IVa	1911	F

Name	Course	Class	Day or Evening
Goldberg, George	VI	1910	D
Good, Henry	Ia	1902	E
Goodchild, George	Ia	1903	E
Goodchild, George	VI	1905	E
Goodhue, Amy H. (See Harrison)			
Goodwin, Ross	Vb	1911	E
Gookin, Alice L.	IIIb	1910	E
Gordon, Herbert E.	IIIa	1909	E
Gordon, Loyd H.	VIa	1913	E
Grant, Archibald	IIb	1901	E
Graves, John F.	VIb	1912	E
Gray, Finley M.	VI	1903	E
Greenhalge, James	Vc	1908	E
Greenwood, Ralph F.	VII	1912	E
Gregson, Robert B.	Va	1906	E
Gregson, Robert B.	Ia-Vc	1907	E
Grouke, Michael	IIb	1901	E
Gustafson, Alfred L.	IVa	1911	E
Gyzander, Arne K.	IV	1909	D
Haartz, John C.	VII	1907	E
Haas, Ignatius	Ia	1907	E
Hadley, Walter E.	IV	1908	D
Haigh, Walter	IIIa	1902	E
Haigh, William	Vb	1906	E
Hallbauer, William R.	Vb	1908	E
Halsell, Elam R.	I-V	1904	D
Hamblett, Harry A.	Ia	1907	E
Handley, John M.	Vb	1911	E
Hanglin, Albert J.	IV	1907	E
Hanglin, William E.	Vb	1907	E
Hannagan, Edward F.	IIb	1913	E
Hansen, Hans M.	VIa	1912	E
Hanslip, Charles W.	Vb	1911	E
Hanson, Edward	IIIa	1908	E
Hanson, Edward	P. G. IIIa	1909	E
Hanson, Edward	Ia	1913	E
Harder, Elmer E.	VI	1905	E
Hardman, David B.	IV	1908	E
Hardy, Philip L.	VI	1910	D
Harmon, Charles F.	I	1899	D
Harris, Charles E.	I	1905	D
Harris, George S.	I	1902	D
Harris, Louis	VII	1908	E
Harrison, Amy Goodhue	IIIb	1900	D
Harrison, Amy Goodhue	P. G. IIIb	1901	D
Hartshorn, George T.	VII	1912	E
Hartwell, Henry E.	VI	1906	E
Hartwell, Marcus H.	Ia-Va	1911	E
Haskell, Spencer H.	II	1907	D
Haskell, Walter F.	IV	1902	D
Hassett, Paul J.	IV	1912	D
Hathorn, George W.	IV	1907	D
Haven, George W.	IIIa	1905	E
Haworth, Joseph	VI	1902	E
Hay, Ernest C.	II	1911	D
Hayes, Michael C.	IIa	1909	E

Name	Course	Class	Day or Evening
Heaton, Forster G.	IV	1911	E
Hebert, Charles L. J.	IV	1907	E
Hempel, Frank	V	1904	E
Hendrickson, Walter A.	II	1911	D
Hennessey, Ambrose M.	VII	1908	E
Hennigan, Arthur J.	II	1906	D
Hering, Paul C.	IIIa	1910	E
Herrick, William E.	VII	1911	E
Herron, Alexander T.	Ia	1913	E
Hibbert, George E.	Va	1910	E
Hibbert, George E.	Vc	1911	E
Hibbert, George E.	Vb	1912	E
Higgins, Alfred	IIIa	1913	E
Higgins, James A.	IIa	1903	E
Higgins, James A.	IIa-b	1904	E
Higginson, Joseph H.	IIIa	1912	E
Hildreth, Harold W.	II-V	1906	D
Hildreth, Harold W.	II	1907	D
Hill, Daniel	IIb	1901	E
Hill, Ellsworth O. C.	IIb	1910	E
Hill, Harold	Ia	1908	E
Hill, Harold	Va	1909	E
Hilliard, William B.	VIa	1910	E
Hillier, Arthur P.	IIb	1909	E
Hintze, Thomas F.	I	1906	D
Hird, Arthur W.	Ia	1910	E
Hird, James A.	IVa	1910	E
Hitchcock, Thomas B.	Ia-IIa-IIIa	1901	E
Hitchen, Harry S.	Vb	1907	E
Hitchen, Thomas G.	Vb	1907	E
Hodge, William	VIa	1911	E
Hodgkins, Albert A.	VII	1909	E
Hodgkins, Albert A.	IIIa	1910	E
Hoellrich, Martin J.	Vb	1908	E
Hoellrich, Martin J.	Vc	1910	E
Hoelzel, Louis C.	VIa	1913	E
Hoessler, Carl, Jr.	IIIa	1906	E
Hogan, James A.	V	1902	E
Holden, Francis C.	IV	1909	D
Holgate, Benjamin	III	1902	D
Holgate, Benjamin	V	1903	D
Holgate, Charles H.	IIa	1901	E
Holland, Walter F.	IIIa	1912	E
Hollings, James L.	I	1905	D
Holmes, Otis M.	VI	1912	D
Holmes, Otis M.	VI	1913	D
Holt, Gavin O.	IVa	1910	E
Holt, Harry C.	VIa	1909	E
Hood, Leslie N.	IV	1912	D
Hook, Russell W.	IV	1905	D
Horsfall, George G.	II-III-V	1904	D
Horton, Chester T.	VI	1913	D
Houston, William I.	IIIa	1909	E
Houston, William I.	Vb	1910	E
Howard, John	V	1900	E
Howard, John	IIIa	1903	E

Name	Course	Class	Day or Evening
Howard, John	IIa	1906	E
Howard, John	VII	1907	E
Howard, Thomas	V	1905	E
Howe, Woodbury K.	I	1910	D
Howell, Edward A.	Va	1909	E
Howker, John	Ia	1913	E
Hoyle, Edward	IIb	1902	E
Hoyle, Joseph	IIb	1904	E
Hoyt, Charles W. H.	IV	1907	D
Hubbard, Ralph K.	IV	1911	D
Huising, Geronimo H.	I	1908	D
Hunt, Chester L.	III	1905	D
Hunt, Herbert R.	VI	1905	E
Hunter, Ralph	IIIa	1901	E
Hunter, Ralph	V	1903	E
Hunton, John H.	VII	1910	E
Hunton, John H.	II	1911	D
Hunton, Lewis G.	IV	1905	E
Hurtado, Leopoldo, Jr.	Vc	1910	E
Hurtado, Leopoldo, Jr.	VI	1910	D
Hutchings, James C.	VII	1912	E
Hutton, Clarence	V	1900	E
Hutton, Clarence	III	1903	D
Hutton, Harold	V	1906	E
Hutton, John M.	Vb	1906	E
Hutton, Thomas V.	Vb	1910	E
Ignatius, Pentti	Va	1907	E
Inberg, Magnus	Ia	1906	E
Ingham, Benjamin W.	Ia	1908	E
Innes, Andrew K.	Vb	1913	E
Jackson, Frank	VIb	1910	E
Jackson, Frank	VIc	1912	E
Jackson, Walter J.	IIa	1913	E
Jarvis, Charles	Vb	1913	E
Jasper, Grant	Vc	1912	E
Jean, Adhemard C.	VIa	1910	E
Jeanotte, Arthur	VI	1904	E
Jelleme, William O.	I	1910	D
*Jenckes, Leland A.	VI	1908	D
Jennings, James J.	IIIa	1903	E
Jepson, Harry	Vb	1907	E
Johnson, Arthur K.	IV	1913	D
Johnson, Ernest A.	IIa-b	1902	E
Johnson, Ernest A.	V	1906	E
Johnson, Samuel L.	V	1903	E
Jones, Everett A.	III	1904	D
Jones, Everett A.	III	1905	D
Jones, Herbert	Ia	1913	E
Jones, William J.	IIb	1900	E
Jones, William J.	IIa	1901	E
Jordan, Frederic W.	IV	1910	E
Jorde, Linville T.	VIc	1910	E
Joyce, John	Vc	1909	E
Jury, Alfred E.	IV	1904	D
Kaler, Harold F.	VIb	1909	E

*Deceased

Name	Course	Class	Day or Evening
Kay, Harry P.	II	1909	D
Keleher, John J.	IIb	1903	E
Kellett, Irvine	II	1899	E
Kelley, Bernard J., Jr.	VIc	1909	E
Kelly, Michael H.	Ia	1902	E
Kelly, Michael H.	IIIa	1907	E
Kennedy, William E.	VIa	1911	E
Kent, Arthur	VIIb	1912	E
Kent, Clarence L.	III-V	1906	D
Kent, Ernest J.	IIb	1902	E
Kenworthy, Joseph	Ia	1903	E
Keough, Wesley L.	II	1910	D
Kerrigan, Arthur J.	VIa	1912	E
Kershaw, Benn	Va	1909	E
Kershaw, Benn	Vc	1910	E
Kershaw, Samuel S.	IIb	1910	E
Kershaw, Samuel S.	Vb	1913	E
Kershaw, William E.	V	1904	E
Kidd, Thomas E.	IV	1906	E
Killerby, Walter	IIb	1901	E
Kimball, Irving D.	VI	1905	E
Kingsbury, Percy F.	IV	1901	D
Kirkpatrick, Lloyd A.	Ia	1913	E
Kirsch, Alfred O.	Vb	1907	E
Knowland, Daniel P.	IV	1907	D
Knowles, Frank E.	Ia	1903	E
Krause, George R.	VII	1910	E
Lachance, Melina	IIIb	1911	E
Laffert, August W.	IIIa	1906	E
Laffert, August W.	VII	1907	E
Lagerblad, Jarl	VII	1908	E
LaJeunesse, Joseph A.	IVa	1910	E
LaJeunesse, Joseph A.	IVc	1913	E
Lake, William F.	IIIa	1907	E
Lake, William F.	P. G. IIIa	1908	E
Lakeman, Fannie S.	IIIb	1900	D
Lamb, Arthur F.	II	1910	D
Lambert, Harry	IIb	1912	E
Lambert, Seth	IIb	1913	E
Lamont, Robert L.	II	1912	D
Lamont, Walter M.	IIb	1902	E
Lamson, George F.	I	1900	D
Lamson, George F.	VI	1905	E
Lane, John W.	I	1906	D
Lane, John W.	I-V	1907	D
Lang, William A.	Vc	1913	E
Langevin, Felix D.	VI	1904	E
Lapierre, Alderic S.	IIIa	1912	E
LaPorte, Philip J.	IVa	1912	E
Laughlin, James K.	III	1909	D
Law, Alfred	IIb	1901	E
Lawliss, Augustine J.	V	1902	E
Lawrence, Charles	Ia	1903	E
Leach, John P.	I-V	1900	D
Leach, Joseph W.	V	1903	E
Learned, Frank E.	Va	1913	E

Name	Course	Class	Day or Evening
Leaver, Raymond J.	VIb	1913	E
Leck, Arthur J.	VII	1910	E
Ledoux, Blanche H.	IIIb	1910	E
Lee, Charles	Ia	1902	E
Lee, William H.	V	1905	D
Leitch, Harold W.	IV	1912	D
Leith, Edwin E.	IIIa	1902	E
Leith, Joseph E.	Vb	1912	E
Lemire, Arthur	Ia	1910	E
Lemire, Arthur	Va	1911	E
Leonard, Charles W.	VII	1913	E
Levi, Alfred S.	IV	1909	D
Lewis, LeRoy C.	IV	1908	D
Lewis, Walter S.	IV	1905	D
Libby, C. Robert	VI	1902	E
Linberg, Joseph F.	IVa	1911	E
Lincourt, Hector L.	VI	1903	E
Lincourt, Henry E.	VIb	1909	E
Linkletter, Alfred C.	VI	1905	E
Lockberg, John L.	VIId	1912	E
Logan, George H. S.	IV	1911	E
Lord, Harry D.	IIIa	1904	E
Lord, Wilfred	IIIa	1901	E
Lord, Wilfred	IIb	1903	E
Lord, Wilfred	IIa	1904	E
Lovell, Charles E.	VI	1905	E
Lowe, Harry F.	Va	1913	E
Lowe, John C.	IIb	1912	E
Lucey, Edmund A.	II	1904	D
*McAlister, John W.	V	1899	E
McAuliffe, Patrick D.	VIb	1910	E
McBride, Robert G.	IIa	1904	E
McCann, Martin	Vb	1912	E
McCarthy, Joseph F.	IIIa	1906	E
McClure, Charles G.	VIb	1909	E
McCool, Frank L.	IV	1910	D
Macdonald, Chester W.	VIa	1912	E
McDonald, William A.	VIb	1913	E
McDonnell, William H.	I-V	1906	D
McElroy, Samuel H.	Vb	1910	E
McGill, William E.	VII	1908	E
McGovern, James	VII	1908	E
McGowan, Annie C.	IIIb	1913	E
McGurn, James P.	VIId	1913	E
Mackay, Stewart	III	1907	D
McKenna, Hugh F.	IV	1905	D
McKenna, Jeremiah J.	Vb	1908	E
McLaughlin, Peter J.	Ia	1906	E
McLay, John	Vb	1906	E
McLay, John	IIb	1909	E
McManus, Hugh	V	1905	E
McNamara, Thomas	Vb	1911	E
MacPherson, Wallace A.	III	1904	D
McQuade, Hugh B.	V	1901	E
Mabbett, Albert L.	IIIa	1910	E

*Deceased

Name	Course	Class	Day or Evening
Madden, Peter	Va	1909	E
Maden, Harry	IIb	1900	E
Maguire, Andrew F.	Vb	1913	E
Maguire, James H.	VI	1905	E
Maguire, James H.	Ia	1906	E
Mahoney, Dennis J.	Vb	1909	E
Mailey, Howard T.	II	1908	D
Maker, Isaac A.	Ia	1908	E
Manning, Frederick D.	IV	1910	D
Manning, James B.	IVa	1911	E
Manning, James B.	IVb	1913	E
Marjerison, Isaiah D.	II	1899	E
Marjerison, T. Sydney	IIIa	1907	E
Marjerison, T. Sydney	P. G. IIIa	1908	E
Marinel, Walter N.	I	1901	D
Marsden, Phillips B.	IVa	1911	E
Marshall, Fred K. R.	VI	1908	E
Martin, Harry W.	IV	1911	D
*Martin, John C., Jr.	IIa-b	1905	E
Martin, Willard E.	IIIa	1907	E
Mason, Archibald L.	VI	1909	D
Mason, Frederick A.	Ia	1903	E
Mather, Harold T.	VI	1913	D
Maxcy, Leo M.	VIc	1910	E
Maynard, Wilfred B.	VII	1913	E
Meadows, William R.	I	1904	D
Meek, Lotta (See Parker)			
Merchant, Edith C.	IIIb	1900	D
Merrill, Allan B.	IV	1911	D
Merrill, Edwin C.	VI	1904	E
Merriman, Earl C.	II	1907	D
Messiah, Hiram G.	Vb	1910	E
Metcalfe, Walter B.	IIb	1913	E
Michael, Joseph C.	Vb	1912	E
Micheltmore, Harry	IIIa	1906	E
Micheltmore, Harry	VII	1907	E
Midwood, Arnold J.	IV	1905	D
Miller, Emil H.	V	1904	E
Miller, Ernest P., Jr.	Ib	1913	E
Milot, Joseph E.	VIc	1911	E
Minge, Jackson C.	I-V	1901	D
Minge, Jackson C.	IIIa	1901	E
Moir, Alexander L.	IIIa	1899	E
Moir, Alexander L.	P. G. IIIa	1903	E
Molloy, Andrew	V	1902	E
Molloy, Andrew	IIIa	1905	E
Molloy, Andrew	P. G. IIIa	1906	E
Molloy, Andrew	P. G. IIIa	1909	E
Monahan, Patrick H.	VId	1913	E
Moore, Everett B.	I	1905	D
Moore, Karl R.	IV	1911	D
Moorehouse, Thomas	VI	1904	E
Moorhouse, William R.	IV	1901	D
Morris, Frank A.	V	1901	E
Morrison, Fred C.	I	1903	D

*Deceased

Name	Course	Class	Day or Evening
Mortenson, Carl W.	IIIa	1903	E
Mortenson, Carl W.	IIa	1908	E
Morton, Albert N.	IIb	1906	E
*Mozley, Arthur	VI	1903	E
Muldoon, Joseph M.	VIIb	1912	E
Mullen, Arthur T.	II	1909	D
Munroe, Sydney P.	I	1912	D
Murphy, Cornelius D.	IIa	1906	E
Murphy, Howard H.	IIb	1911	E
Murphy, John H.	VI	1904	E
Murphy, Leo T.	Vc	1913	E
Murray, James	IV	1913	D
Murray, James A.	II	1910	D
Musard, Albert E., Jr.	Vc	1909	E
Musard, Henry A.	Vc	1913	E
Myers, James W.	IIIa-IV	1903	E
Myers, James W.	VII	1907	E
Najarian, Garabed	IV	1903	D
*Naylor, Charles	IVa	1912	E
Nelson, Charles E.	IIb	1907	E
Nelson, Ernest H.	IIb	1900	E
Nelson, Ernest H.	IIa	1901	E
Nelson, Ernest H.	IIIa	1906	E
Nelson, Ernest H.	Ia	1909	E
Nelson, Ernest H.	Vc	1910	E
Nelson, Ernest H.	Ib	1913	E
Nelson, Gustave A.	Vb	1910	E
Nelson, James A.	Ia	1911	E
Nelson, Sigfred	VId	1911	E
Newall, J. Douglas	IV	1909	D
Newall, Preston	Ia	1911	E
Newcomb, Guy H.	IV	1906	D
Newsholme, Charles E.	VIIb	1911	E
Nichol, Samuel J.	IVa	1911	E
Nichols, Clarence W.	Vb	1910	E
Nichols, Nathan A.	VIIb	1911	E
Nichols, Raymond E.	VI	1910	D
Nicholson, Richard	IIb	1903	E
Nicoll, John	IVa	1910	E
Nicoll, John	IVb	1913	E
Niven, Robert S.	VI	1912	D
Noble, John T.	V	1899	E
Noble, John T.	IIIa	1901	E
Noonan, Denis T.	IIIa	1903	E
Notman, Frederick W.	Ia	1904	E
Nugent, Thomas A.	II-V	1899	E
Nugent, Thomas A.	VI	1902	E
Nutter, James R.	VI	1908	E
O'Brien, David A.	IV	1906	E
O'Brien, Michael F.	IIb	1907	E
O'Connell, Clarence E.	IV	1911	D
O'Donnell, John D.	I-V	1904	D
Ogley, Samuel A.	IIb	1900	E
O'Hara, William F.	IV	1904	D
O'Neill, Peter F.	IV	1905	E

*Deceased

Name	Course	Class	Day or Evening
Orrell, Ernest R.	VIa	1913	E
Orrell, Frank L.	VIb	1909	E
Orrell, Frank L.	IIb	1912	E
Orrell, Frank L.	Vb	1913	E
*Osbeck, William J.	IIIa	1908	E
Osgood, Charles F.	Ia	1900	E
Osgood, Charles F.	VI	1902	E
Overend, John	V	1905	E
Palm, Carl H.	VIa	1912	E
Palmer, G. Buel	IIIa	1903	E
Palmer, G. Buel	Vb	1909	E
Paquin, Joseph	VIa	1909	E
Paquin, Joseph	VIb	1910	E
Parker, B. Moore	I	1901	D
Parker, Everett N.	I-III-V	1904	D
Parker, Everett N.	I	1905	D
Parker, Harry C.	V	1900	D
Parker, Lotta Meek	IIIb	1907	D
Parkin, Prescott R.	Vb	1911	E
Parkis, William L.	I	1909	D
Parsons, Joseph G.	IIIa	1909	E
Patrick, Alexander	IIIa	1904	E
Patterson, Alfred H.	IIIa	1908	E
Pearson, Alfred H.	IV	1911	D
Pearson, Fred	VIa	1909	E
Pease, Chester C.	I	1909	D
Peck, Carroll W.	IV	1913	D
Pedler, William A.	Ia	1906	E
Pedler, William A.	IVa	1911	E
Peel, Hudson	IIb	1901	E
Pensel, George R.	IV	1913	D
Perkins, John E.	III	1900	D
Perkins, J. Dean	III	1908	D
Perkins, Thomas, Jr.	Ia	1908	E
Perron, Francis J.	Vb	1911	E
Perry, Clarence R.	IIb	1911	E
Petterson, Birger	VIa	1910	E
Petty, George E.	I-V	1903	D
Phelps, Mary I.	IIIb	1910	E
Picken, William T.	IIIa	1908	E
Pihl, Christian E.	VI	1906	E
Pihl, Ingrid I.	IIIb	1912	E
Pillsbury, Ray C.	I	1913	D
Pittendreigh, John M.	Ia	1906	E
Plumer, Paul T.	Vb	1908	E
Plummer, Elliott B.	IV	1913	D
Porter, George K., Jr.	IIIa	1907	E
Porter, George K., Jr.	P. G. IIIa	1908	E
Potter, Carl H.	I	1909	D
Potter, Richard W.	V	1902	E
Pottinger, James G.	II	1912	D
Pradel, Alois J.	III	1900	D
Pradel, Anna Walker	IIIb	1903	D
Preble, George A.	IIIa	1908	E
Preble, George A.	Va	1912	E

*Deceased

Name	Course	Class	Day or Evening
Preble, George A.	Vb-c	1913	E
Prescott, Walker F.	IV	1909	D
Prescott, William B.	Va	1912	E
Prince, Sylvanus C.	VI	1908	D
Proctor, Braman	IV	1908	D
Putnam, Leverett N.	IV	1910	D
Putnam, Philip C.	IV	1913	D
Quinn, James H.	VII	1913	E
Racicot, Marie E.	IIIb	1911	E
Ramsdell, Theodore E.	I	1902	D
Randall, William O.	IIb	1913	E
*Rasche, William A.	III	1903	D
Raymond, Charles A.	IV	1907	D
Read, Paul A.	VII	1907	E
Read, Paul A.	Va	1909	E
Reardon, Timothy H.	VI	1906	E
Redman, Henry S.	IIIa	1904	E
Redman, Henry S.	V	1905	E
Redman, Henry S.	Ia	1907	E
Redman, Henry S.	IV	1910	E
Redman, Henry S.	VIa	1912	E
Redman, Henry S.	Ib	1913	E
Redpath, Robert H.	VII	1913	E
Reed, Foster C. K.	VI	1904	E
Reed, Norman B.	I	1910	D
Reynolds, Eugene A.	VI	1906	E
Reynolds, Fred B.	II	1908	D
Reynolds, Hiram L.	IIIa	1901	E
Reynolds, Isabel H.	III-V	1903	D
Reynolds, Isabel H.	P. G. III-V	1906	D
Reynolds, James J.	Vc	1913	E
Rhodes, Joseph E.	V	1904	E
Rich, Everett B.	III	1911	D
Richards, Francis G.	IIa	1906	E
Richardson, Richardson P.	I	1913	D
Riley, Edward T.	IIIa	1912	E
*Ritter, Alfred E.	IIb	1907	E
Robbins, John	IIb	1907	E
Roberson, Pat H.	I	1905	D
Roberts, Carrie I.	IIIb	1905	D
Robinson, Ernest W.	IV	1908	D
Robinson, James E.	VII	1911	E
Robinson, Ruddach P.	VII	1911	E
Robinson, Thomas	Ia	1909	E
Robinson, Thomas	Vc	1910	E
Robinson, William C.	III-V	1903	D
Robson, Frederick W. C.	IV	1910	D
Roche, Raymond V.	IV	1912	D
Rockwell, Henry D.	IIa	1903	E
Rockwell, Samuel F.	IIa	1902	E
Rogers, John F.	Ia	1911	E
Rollins, Henry E.	VII	1912	E
Rollins, Sidney R.	IIb	1913	E
Rooney, George W.	Ia	1904	E
Root, Francis X., Jr.	IIIa	1910	E
*Rowell, Herman C.	Ia-IIb	1900	E

*Deceased

Name	Course	Class	Day or Evening
Rowlands, Harold	Va	1911	E
Royds, James	Ia	1912	E
Rundlett, Arnold D.	VI	1912	D
Rushworth, Walter	VI	1906	E
Ryan, Edward P.	Ia	1909	E
Saalfrank, Joseph C.	IIIa	1908	E
Saunders, Edward B.	IIIa	1901	E
Saunders, Harold F.	IV	1909	D
Savage, Charles F.	IVa	1912	E
Scally, Edward	VI	1908	E
Scanlon, Edward J.	IIb	1901	E
Schermerhorn, George E.	Ia	1902	E
Schermerhorn, George E.	Va	1908	E
Schofield, John S.	IIIa	1903	E
Schoon, Fenton	IIb	1903	E
Schubert, George J.	V	1906	E
Schubert, George J.	IIIa	1909	E
Schuerfeld, Harry W.	IIIa	1909	E
Schuster, William F.	VII	1908	E
Seddon, N. Graham	IIIa	1908	E
Semple, Alexander	IIIa	1908	E
Senior, George	Va	1906	E
Senior, George	Ia-Vc	1907	E
Shackleton, John H.	IV	1908	E
Shackleton, John H.	Ia	1910	E
Shaffer, William A.	VId	1911	E
Shannon, Philip J.	V	1901	E
Sharpe, John R.	VI	1906	E
Shaw, James	V	1904	E
Shaw, William	VIa	1913	E
Shea, Francis J.	II	1912	D
Shearer, David D.	VII	1912	E
Shearer, David D.	Vb	1913	E
Sheppard, Byron H.	VI	1906	E
Shields, John J.	Va	1911	E
Sidebottom, Leon W.	IV	1911	D
Silcox, Arthur E.	Ia	1900	E
Silk, Frederick C. M.	IV	1905	E
Silk, Patrick E.	VII	1906	E
Simola, Emil J.	IIa-b	1905	E
Simoneau, Verner W.	VI	1908	E
Skidmore, Russell P.	VIIb	1912	E
Skinner, Clarence W.	IIIa	1905	E
Skinner, Clarence W.	P. G. IIIa	1906	E
Skinner, Clarence W.	VII	1907	E
Sleeper, Robert R.	IV	1900	D
Sleeper, Robert R.	VII	1913	E
*Smith, Albert A.	I	1899	D
Smith, Arthur	IIIa	1905	E
Smith, Arthur	P. G. IIIa	1906	E
Smith, Arthur	Va	1906	E
Smith, Arthur	Vc	1907	E
Smith, Arthur	P. G. IIIa	1909	E
Smith, Doane W.	II	1910	D
Smith, Edward	Ia	1904	E

*Deceased

Name	Course	Class	Day or Evening
Smith, Ernest B.	Vb	1907	E
Smith, Fred	IIb	1901	E
Smith, George A.	IIIa	1905	E
Smith, George A.	P. G. IIIa	1906	E
Smith, George A.	VII	1909	E
Smith, James	Vb	1907	E
Smith, John W.	IIb	1904	E
Smith, Percy H.	Vb	1907	E
Smith, Ralston F.	I	1904	D
Smith, Stephen E.	I	1900	D
Smith, Theophilus G., Jr.	IV	1910	D
Smith, William E.	IIIa	1905	E
Smith, William E.	P. G. IIIa	1906	E
Smith, William E.	VII	1907	E
Smith, William E.	P. G. IIIa	1909	E
Smith, William F.	VIId	1912	E
Smith, William H.	IIb	1902	E
Snelling, Fred N.	II	1903	D
Snow, Fred L.	IV	1900	E
Soule, William N.	VIId	1913	E
Spedding, Ephraim H.	IIIa	1899	E
Spiegel, Edward	V	1903	D
Spurr, Albert R.	VII	1908	E
Spurr, James H., Jr.	IV	1908	E
Standish, John C.	IV	1911	D
Stanley, John R.	IIb	1911	E
Stearns, Orlo F.	IVa	1911	E
Sterling, Walter	IIIa	1904	E
Stevens, Dexter	I	1904	D
Stevens, Frank W.	VI	1905	E
Stevens, Harold S.	IIIa	1912	E
Stevenson, Murray R.	III-V	1903	D
Stevenson, Robert P.	Ia	1912	E
Stevenson, William	II	1899	E
Stevenson, William	IIIa	1902	E
Stewart, Arthur A.	II	1900	D
Stewart, Charles	Va	1908	E
Stewart, George	Ia-IVa	1911	E
Stewart, Walter L.	III	1903	D
Stewart, William W.	IV	1910	E
Stockham, Burton I.	IV	1903	E
Stockham, Burton I.	P. G. IV	1904	E
Stocks, Carl W.	VIa	1909	E
Stohn, Alexander C.	III-V	1906	D
Stone, Ira A.	IV	1909	D
Stopherd, William H.	II-V	1899	E
Stopherd, William H.	VI	1902	E
Stopherd, William H.	IIIa	1905	E
Stopherd, William H.	P. G. IIIa	1906	E
Stopherd, William H.	P. G. IIIa	1909	E
Stopherd, William H.	VII	1910	E
Storer, Francis E.	II	1907	D
Stott, Bertram S.	Vb	1910	E
Stott, Samuel	IV	1910	E
Stronach, Irving N.	IV	1910	D

Name	Course	Class	Day or Evening
*Stursberg, Paul W.	II	1907	D
Sugden, Albert G.	IIIa	1912	E
Sugden, Albert G.	VII	1913	E
*Sullivan, Humphrey F.	Ia	1909	E
Sullivan, John D.	VI	1912	D
Sullivan, Michael F.	VIb	1910	E
Sullivan, Michael F.	VIa	1913	E
Swan, Guy C.	II	1906	D
Swanson, Victor E.	IVa	1912	E
Swift, Edward S.	V	1899	E
Swift, Edward S.	Ia	1901	E
Swift, Edward S.	I	1902	D
Sykes, Alvin E.	VIa	1909	E
Sylvain, Charles E.	VI	1913	D
Syme, James F.	II	1900	D
Tarpey, John F.	IIa	1904	E
Taylor, Harold S.	VIb	1912	E
Teichmann, Alfred A.	Vb	1908	E
Tennant, Joseph A.	VIb	1911	E
Thaxter, Joseph B., Jr.	II	1912	D
Thomas, Roland V.	I	1905	D
Thompson, Charles B.	VI	1904	E
Thompson, Everett L.	I	1905	D
Thompson, Henry J.	IV	1900	D
Tilton, Elliott T.	II	1899	D
Todd, Henry	VII	1910	E
Tonge, John	IV	1905	E
Tonge, Matthew	IIIa	1903	E
Toovey, Sidney E.	V	1904	D
Toshach, Reginald A.	II	1911	D
Towers, Frederic G.	Ia	1912	E
Tucker, John T.	Ia	1908	E
Tucker, John T.	Va	1909	E
Turgeon, Roderick	IVa	1912	E
Umpleby, Thomas B.	V	1902	E
Upton, Frank A.	Ia	1903	E
Varney, Manley H.	IIIa	1902	E
Varney, Manley H.	Ia	1903	E
Varnum, Arthur C.	II	1906	D
Varnum, Arthur C.	Vb	1907	E
Varnum, Arthur C.	P. G. IIIa	1908	E
Varnum, Arthur C.	VII	1909	E
Vause, John	Va	1912	E
Vogt, Alfred H.	IIIa	1902	E
Vogt, Alfred H.	IIb	1909	E
Vogt, Harry A.	Vb	1906	E
Wade, Frank J.	Vb	1911	E
Wahlberg, Einar S.	Ia	1907	E
Wainwright, Harold	IVa	1913	E
Walen, Ernest D.	VI	1913	D
Walker, Alfred S.	II	1911	D
Walker, Anna G. (See Pradel)			
Walker, David	IIIa	1902	E
Walker, David	P. G. IIIa	1903	E
Walker, William, Jr.	VII	1906	E

*Deceased

Name	Course	Class	Day or Evening
Walsh, Michael L.	Ia	1909	E
Walton, Frank L.	Ia	1911	E
Ward, Bernard D.	IIIa	1911	E
Ward, Herbert H.	Vb	1912	E
Ward, James J.	VII	1906	E
Wardrobe, William L.	Ia	1900	E
Ware, Edward W.	IIIa	1909	E
Warren, Philip H.	II	1905	D
Waterhouse, Joseph	IV	1900	E
Waterworth, Frank W.	Vb	1907	E
Watson, Luther F.	IIb	1909	E
Watson, William	III	1911	D
Webb, Francis H.	V	1904	E
Webb, Francis H.	IIIa	1907	E
Webb, Frank H.	IV	1904	D
Webber, Arthur H.	IV	1901	D
Webber, John F.	IIIa	1907	E
Webber, John F.	P. G. IIIa	1908	E
Webster, Orrin H.	Ia	1912	E
Weigel, Frederick A.	VIb	1909	E
Weinz, W. Elliot	IV	1908	D
Welch, Benjamin L.	VIb	1910	E
Wesson, Paul B.	Ia	1901	E
Wheelock, Stanley H.	II	1905	D
*Whitcomb, Harry E.	Ia	1906	E
Whitcomb, Roscoe M.	IV	1910	D
White, Royal P.	II	1904	D
Whitehead, Bennett	IIb	1901	E
Whitehill, Warren H.	IV	1912	D
Whitman, William P.	IVa	1910	E
Whitman, William P.	IVb	1913	E
Whitney, Frederick A.	IV	1910	E
Whittaker, Thomas B.	IIb	1907	E
Whittaker, Thomas B.	IIb	1908	E
Wicks, Frederic M.	IIIa	1912	E
Wiggin, Leon M.	IIIa	1907	E
Wiggin, Leon M.	P. G. IIIa	1908	E
Wightman, William H.	IV	1906	D
Wilde, Thomas E.	IIa	1905	E
Wilkinson, Joseph	IIIa	1912	E
Wilkinson, Joseph	VII	1913	E
Wiley, Frank S.	Ia	1901	E
Willgeroth, Henry J.	IIIa	1908	E
Williams, Allen R.	Ia	1910	E
Williams, Allen R.	Va	1911	E
Williamson, Isaac F.	IV	1901	E
Willmott, Herbert J.	VIa	1911	E
Wilmot, Joseph	IIIa	1908	E
Wilmot, William	IIIa	1899	E
Wilson, Calvin E.	IIb	1902	E
Wilson, George H.	IIb	1902	E
Wilson, John S.	II	1903	D
*Wilson, Walter E. H.	I-V	1904	D
Wilton, George H.	IIIa	1899	E
Wing, Charles T.	IIIa	1900	E

*Deceased

Name	Course	Class	Day or Evening
Wing, Charles T.	III	1902	D
Wingate, William H.	IV	1908	D
Wise, Paul T.	II	1901	D
Wiswall, Frank T.	V	1905	E
Wolf, William C.	Va	1907	E
Wolf, William C.	Vb	1908	E
Wolger, John J.	IIIa	1907	E
Wollin, Frederick W.	Va	1911	E
Wood, Arthur S.	Va	1912	E
Wood, Ernest H.	IV	1911	D
Wood, Herbert C.	I	1906	D
Wood, J. Carleton	IV	1909	D
Wood, Jonathan	Ia	1902	E
Wood, Jonathan	Va	1908	E
Woodbury, W. Sanford	Ia	1900	E
Woodcock, Eugene C.	II	1907	D
Woodies, Ida A.	IIIb	1900	D
Woodies, Ida A.	P. G. IIIb	1901	D
Woodman, Harry L.	I-III-V	1902	D
Woodruff, Charles B.	V	1906	D
Worthington, John A.	Ia	1910	E
Wright, Edward, Jr.	II	1905	D
Wright, Frederick J.	Vb	1911	E
Yare, John F.	Vb	1907	E
Yavner, Harry	II	1912	D
Young, Richard, Jr.	Va	1908	E
Young, Richard, Jr.	Vc	1909	E
Younger, Andrew	IIIa	1913	E

REGISTER OF GRADUATES

(P. G.) Indicates Post Graduate Course

(x) Indicates Last Known Address

(*) Deceased

Day Course, 1899

Diploma Graduates

Name	Course	Occupation
xBailey, Joseph W.	I	Superintendent, Davis Mills, Fall River, Mass.
xCuttle, James H.	II	Designer, William Whitman and Co., New York City.
xFels, August B.	II	With William Fels, Inc., New York City.
xHarmon, Charles F.	I	Lowell, Mass.
*Smith, Albert A.	I	
xTilton, Elliott T.	II	With Western Electric Co., Boston, Mass.

Certificate Holders

Burrage, Katherine C.	IIIb	Teacher of Pottery, North Bennet St. Industrial School, Boston, Mass.
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Evening Course, 1899

Certificate Holders

*Berry, Frank M.	IIIa	
Binns, Heaton	II-V	Foreman, Worsted Department, Shuttleworth Bros. Co., Amsterdam, N. Y.
Broadbent, James T.	Ia	Agent, Meritas Mills, New York City.
xCollier, John	IIIa	Superintendent and Manager, Crawford Woolen Co., Martinsburg, W. Va.
Crompton, Henry H.	II	Overseer, Worsted Yarns, Pacific Mills, Lawrence, Mass.
Gaunt, Alfred C.	IIIa	General Manager, Merrimac Mills, Methuen, Mass.
xKellett, Irvine	II	Second Hand, Worsted Yarns, Pacific Mills, Lawrence, Mass.
*McAlister, John W.	V	
Marjerison, Isaiah D.	II	Overseer, Worsted Combing, Lower Pacific Mills, Lawrence, Mass.
Moir, Alexander L.	IIIa	Letter Carrier, Lowell, Mass.
Noble, John T.	V	Overseer, Sawyer Woolen Mills, Dover, N. H.
Nugent, Thomas A.	II-V	Foreman, Worsted Department, McClarey, Wallin & Crause, Amsterdam, N. Y.
Spedding, Ephraim H.	IIIa	Lowell, Mass.
xStevenson, William	II	Superintendent, Franklin Woolen Mills, Franklin, Ky.
Stopherd, William H.	II-V	With Saco-Lowell Shops, Lowell, Mass.

Name	Course	Occupation
Swift, Edward S.	V	Scholastic of the Society of Jesus, Woodstock College, Woodstock, Md.
Wilmot, William	IIIa	Designer, Hamilton Webb Co., Hamilton, R. I.
xWilton, George H.	IIIa	Overseer, M. T. Stevens and Sons Company, North Andover, Mass.

Day Course, 1900

Diploma Graduates

Baldwin, Arthur L.	IV	President, Monarch Chemical Laboratory, Lowell, Mass.
Barr, I. Walwin	I	Styler, F. U. Stearns & Co., New York City.
Bodwell, Henry A.	II	Superintendent, Smith and Dove Mfg. Co., Andover, Mass.
Brickett, Chauncey J.	II	Principal, School of Textiles, International Correspondence Schools, Scranton, Pa.
Lamson, George F.	I	Draftsman, Chas. T. Main, Engineer, Boston, Mass.
Perkins, John E.	III	Assistant Superintendent, S. N. and C. Russell Mfg. Co., Pittsfield, Mass.
Pradel, Alois J.	III	Superintendent, Montrose Woolen Mills, Woonsocket, R. I.
Sleeper, Robert R.	IV	Instructor in Dyeing, Lowell Textile School, Lowell, Mass.
Smith, Stephen E.	I	Head Instructor, Cotton Department, Lowell Textile School, Lowell, Mass.
Stewart, Arthur A.	I	Head Instructor, Finishing, Lowell Textile School, Lowell, Mass.
Syme, James F.	II	Assistant Treasurer and General Superintendent, American Felt Co., Boston, Mass.
Thompson, Henry J.	IV	Dyer, Boston Rubber Shoe Co., Malden, Mass.

Certificate Holders

Burrage, Katherine C.	P. G. IIIb	See Day Course, 1899.
Campbell, Laura E.	IIIb	Designer, Lowell, Mass.
xHarrison, Mrs. Amy H. (Goodhue)	IIIb	Dracut, Mass.
Lakeman, Fannie S.	IIIb	Designer, Salem, Mass.
xLeach, John P.	I-V	Foreman, Harriet Cotton Mills, Henderson, N. C.
Merchant, Edith C.	IIIb	Supervisor of Drawing, Pepperell, Mass.
Parker, Harry C.	V	With George L. Parker, Boston, Mass.
Woodies, Ida A.	IIIb	Decorator, Lowell, Mass.

Evening Course, 1900

Certificate Holders

Campbell, Albert D.	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
Cawthra, Albert B.	IIb	Overseer, U. S. Bunting Co., Lowell, Mass.

Name	Course	Occupation
Colby, Arthur D.	Ia	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Donnelly, James	Ia	Overseer, Mule Spinning, Greylock Mills, North Pownal, Vt.
Elston, Frederick R.	IIIa	Assistant Superintendent and Designer, Shackamaxon Worsted Co., Philadelphia, Pa.
Howard, John	V	Overseer, Weaving, Thos. Kent Mfg. Co., Clifton Heights, Pa.
Hutton, Clarence	V	Circulation Manager, Lord and Nagle Co., Boston, Mass.
Jones, William J.	IIb	Overseer, Worsted Spinning, U. S. Bunting Co., Lowell, Mass.
xMaden, Harry	IIb	North Adams, Mass.
Nelson, Ernest H.	IIb	Designer, Merrimack Mfg. Co., Lowell, Mass.
Ogley, Samuel A.	IIb	Overseer, Worsted Spinning, Steere Worsted Mills, Providence, R. I.
Osgood, Charles F.	Ia	Draftsman, General Electric Company, Lynn, Mass.
*Rowell, Herman C.	Ia-IIb	
Silcox, Arthur E.	Ia	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Snow, Fred L.	IV	Granite Contractor, Snow & Horsfall, Lowell, Mass.
Wardrobe, William L.	Ia	
xWaterhouse, Joseph	IV	Section Hand, Merrimack Mfg. Company, Lowell, Mass.
Wing, Charles T.	IIIa	Designer, Middlesex Mfg. Company, Lowell, Mass.
Woodbury, W. Sanford	Ia	Superintendent of Carding, Warner Mills and American Textilose Co., Newburyport, Mass.

Day Course, 1901

	Diploma	Graduates
Buchan, Donald C.	II	Assistant Superintendent, Stevens Mills, North Andover, Mass.
Currier, John A.	II	Superintendent, Pentucket Mills, M. T. Stevens and Sons Co., Haverhill, Mass.
xEwer, Nathaniel T.	IV	Chemist, American Dyewood Co., Chester, Pa.
Foster, Clifford E.	II	Superintendent, Ludlow Manufacturing Associates, Ludlow, Mass.
Kingsbury, Percy F.	IV	Overseer, Color Dept., Merrimack Mfg. Co., Lowell, Mass.
Marinel, Walter N.	I	In Automobile Business, North Chelmsford, Mass.
Moorhouse, William R.	IV	Chemist, Cassella Color Co., Boston, Mass.
Parker, B. Moore	I	Instructor, Carding and Spinning, A. and M. College, West Raleigh, N. C.
Webber, Arthur H.	IV	Chemist and Dyer, Melville Color Co., Beverly, Mass.
Wise, Paul T.	II	Manufacturing Agent and Assistant General Manager, Chelsea Fibre Mills, Brooklyn, N. Y.

Certificate Holders		
Name	Course	Occupation
Bradley, Richard H.	V	Second Hand, Hargreaves Mill No. 2, Fall River, Mass.
xHarrison, Mrs. Amy H. (Goodhue)	P. G. IIIb	See Day, 1900.
Minge, Jackson C.	IV	Treasurer, Minge Mfg. Co., Demopolis, Ala.
Woodies, Ida A.	P. G. IIIb	See Day, 1900.

Evening Course, 1901

Certificate Holders		
xAspinwall, William	IIb	Philadelphia, Pa.
*Berry, Frank M.	V	
xBrooks, Noah	IIIa-V	Lowell, Mass.
xBurghardt, Paul C.	IIa	Second Hand, Card Room, Merrimack Woolen Co., Lowell, Mass.
Buzzell, William O.	IIIa	Overseer, Weaving, Bristol Mfg. Co., New Bedford, Mass.
Cheetham, John James	IIIa	Overseer, Cabot Mfg. Co., Brunswick, Me.
Chippindale, Ernest W.	IIb	Pile Wire Maker, Frank Parker Pile Wire Co., Lowell, Mass.
Cowdell, Herbert	V	With Ipswich Mills, Lowell, Mass.
*Davis, Henry	IIb	
xDonovan, Daniel F.	IIa	Second Hand, Woolen Carding, Yonkers, N. Y.
Evison, William A.	V	Loomfixer, Massachusetts Cotton Mills, Lowell, Mass.
Farrell, Thomas	IIa	Woolen Spinner, Stirling Mills, Lowell, Mass.
Frame, William C.	V	Overseer, Johnson & Johnson, New Bruns- wick, N. J.
Gagan, John H.	V	Assistant Dyer, Clinton Woolen Co., Clinton, Mich.
Grant, Archibald	IIb	Lowell, Mass.
Gourke, Michael	IIb	Overseer, Worsted Drawing, Bigelow Car- pet Company, Lowell, Mass.
xHill, Daniel	IIb	Overseer, Passaic Worsted Spinning Co., Passaic, N. J.
Hitchcock, Thomas B.	Ia-IIa-IIIa	Assistant to Treasurer, International Cot- ton Mills Corporation, Boston, Mass.
Holgate, Charles H.	IIa	With A. R. Andrews, Boston, Mass.
Hunter, Ralph	IIIa	Salesman, Hall, Hartwell and Company, New York City.
Jones, William J.	IIa	See Evening, 1900.
Killerby, Walter	IIb	Overseer, Park Worsted Mill, Lowell, Mass.
Law, Alfred	IIb	Overseer, Arlington Mills, Lawrence, Mass.
Lord, Wilfred	IIIa	Assistant Superintendent, Worsted Dept., Pacific Mills, Lawrence, Mass.
McQuade, Hugh B.	V	With Bigelow Carpet Company, Lowell, Mass.

Name	Course	Occupation
Minge, Jackson C.	IIIa	See Day, 1901.
xMorris, Frank A.	V	Loomfixer, Lowell, Mass.
Nelson, Ernest H.	IIa	See Evening, 1900.
Noble, John T.	IIIa	See Evening, 1899.
Peel, Hudson	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
Reynolds, Hiram L.	IIIa	Agent, Saunders Cotton Mills, Saundersville, Mass.
xSaunders, Edward B.	IIIa	Salesman, Remington Typewriter Co., Fall River, Mass.
Scanlon, Edward J.	IIb	In business, Lawrence, Mass.
Shannon, Philip J.	V	Die Maker, Tubular Rivet and Stud Company, Wollaston, Mass.
*Smith, Fred	IIb	
Swift, Edward S.	Ia	See Evening 1899.
Wesson, Paul B.	Ia	Mechanical Superintendent, Wright Wire Co., Palmer, Mass.
Whitehead, Bennett	IIb	Overseer, Wood Worsted Mills, Lawrence, Mass.
Willey, Frank S.	Ia	Second Hand, Picking and Carding, Pacific Mills, Lawrence, Mass.
Williamson, Isaac F.	IV	Boss Dyer, Hamilton Mfg. Co., Lowell, Mass.

Day Course, 1902

Diploma Graduates

xBurnham, Frank E.	IV	Chemist, Avery Chemical Co., Boston, Mass.
Carter, Robert A.	IV	Chemist and Textile Expert, Roessler & Hasslacher Chemical Company, New York City.
xCraig, Clarence E.	III	With Kansas City Cotton Mills Co., Kansas City, Kans.
Haskell, Walter F.	IV	Overseer of Dyeing, Dana Warp Mills, Westbrook, Me.
Ramsdell, Theodore E.	I	Agent, Monument Mills, Housatonic, Mass.
Swift, Edward S.	I	See Evening, 1899.
Wing, Charles T.	III	See Evening, 1900.

Certificate Holders

Curran, Charles E.	II-III-V	Head Designer, Wood Worsted Mills, Lawrence, Mass.
xFerguson, Arthur F.	I	Head of Textile Dept., Rhode Island School of Design, Providence, R. I.
Harris, George S.	I	Superintendent, Lanett Cotton Mills, Lanett, Ala.
Holgate, Benjamin	III	Cost Accountant, Boott Mills, Lowell, Mass.
Woodman, Harry L.	I-III-V	Draftsman, Saco-Lowell Shops, Lowell, Mass.

Evening Course, 1902

Certificate Holders		
Name	Course	Occupation
xAdams, Wm. R.	IIa	Pressman, Stevens Mills, No. Andover, Mass.
xBarlow, Robert	V	Lowell, Mass.
Binns, Heaton	VI	See Evening, 1899.
Bowring, George P. B.	VI	Optometrist, Lowell, Mass.
xBrainerd, Irving L.	Ia	Overseer, Carding, W. L. Barrell and Co., Lawrence, Mass.
xBurghardt, Edward S.	IIa	Lawrence, Mass.
Buzzell, William O.	P. G. IIIa	See Evening, 1901.
Cheetham, John James	P. G. IIIa	See Evening, 1901.
Collier, John	P. G. IIIa	See Evening, 1899.
Cowdrey, Charles E.	V	Overseer, Talbot Mills, North Billerica, Mass.
xCremmin, Daniel J.	Ia	Second Hand, Boott Mills, Lowell, Mass.
xDonnellan, Frank T.	IIa	Lowell, Mass.
xDudley, George E.	Ia	Third Hand, Carding, Mass. Mills, Lowell, Mass.
Ferguson, Thomas	V	Overseer, Boott Mills, Lowell, Mass.
xField, Charles W.	VI	Draftsman, C. F. Morrill, Somerville, Mass.
xForrest, Fred G.	IIa	Finishing Room, Middlesex Co., Lowell, Mass.
Fortune, David A.	IIb	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Gaunt, Alfred C.	P. G. IIIa	See Evening, 1899.
xGood, Henry	Ia	Providence, R. I.
xHaigh, Walter	IIIa	U. S. Bunting Co., Lowell, Mass.
xHaworth, Joseph	VI	Travelling Mechanical Engineer, C. G. Sargent's Sons Corp., Graniteville, Mass.
Hogan, James A.	V	Hogan Bros., Lowell, Mass.
Hoyle, Edward	IIb	President and Manager, Allerton Worsted Mills, Lowell, Mass.
Johnson, Ernest A.	IIa-b	Superintendent, Washington Mills, Lawrence, Mass.
Kelly, Michael H.	Ia	Overseer, Appleton Co., Lowell, Mass.
Kent, Ernest J.	IIb	Section Hand, English Drawing, Lower Pacific Mills, Lawrence, Mass.
Lamont, Walter M.	IIb	Agent, Wood Worsted Mill, Lawrence, Mass.
xLawliss, Augustine J.	V	Overseer, Weaving, Belyidere Woolen Co., Lowell, Mass.
Lee, Charles	Ia	Machinist, Saco-Lowell Shops, Lowell, Mass.
Leith, Edwin E.	IIIa	Superintendent, Thos. Kent Mfg. Co., Clifton Heights, Pa.
Libby, C. Robert	VI	Assistant Engineer, Locks & Canals, Lowell, Mass.
Molloy, Andrew	V	In City Water Department, Lowell, Mass.
Nugent, Thomas A.	VI	See Evening, 1899.
Osgood, Charles F.	VI	See Evening, 1900.
Potter, Richard W.	V	Overseer, Weaving, Massachusetts Cotton Mills, Lowell, Mass.

Name	Course	Occupation
Rockwell, Samuel F.	IIa	Superintendent, Mule Dept., Davis and Furber Machine Co., No. Andover, Mass.
Schermerhorn, George E.	Ia	Superintendent, Chipman Mfg. Co., Easton, Pa.
Smith, William H.	IIb	Stamp Clerk, Post Office, Lawrence, Mass.
Stevenson, William	IIIIa	See Evening, 1899.
Stopherd, William H.	VI	See Evening, 1899.
Umpleby, Thomas B.	V	Designer, Stanley Woolen Company, Uxbridge, Mass.
Varney, Manley H.	IIIIa	Superintendent, Finishing Dept., Amoskeag Mfg. Co., Manchester, N. H.
xVogt, Alfred H.	IIIIa	Designing Room, George E. Kunhardt, Lawrence, Mass.
Walker, David	IIIIa	Overseer, Burlington Mills, Winooski, Vt.
xWilson, Calvin E.	IIb	Overseer, Anco Mill, Wilkinsonville, Mass.
Wilson, George H.	IIb	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Wood, Jonathan	Ia	Overseer, Lawrence Mfg. Co., Lowell, Mass.

Day Course, 1903

Diploma Graduates

xBloom, Wilfred N.	IV	Assistant Manager, Read, Holliday and Sons, Ltd., New York City.
xCampbell, Orison S.	II	Superintendent, American Felt Co., Franklin, Mass.
Chamberlin, Frederick E.	I	Overseer of Spinning, Monument Mills, Housatonic, Mass.
Emerson, Frank W.	II	Superintendent, Moosup Mills, Moosup, Conn.
xEvans, Alfred W.	III	Arlington Mills, Lawrence, Mass.
xEvans, William R.	III	Bradford, Mass.
Ferguson, Arthur F.	I	See Day, 1902.
xFuller, George	I	Associate Editor, American Wool and Cotton Reporter, New York City.
xGerrish, Walter	III	With Allen Lane Co., Boston, Mass.
Morrison, Fred C.	I	Assistant Superintendent, Levi W. Phelps, Ayer, Mass.
Najarian, Garabed	IV	Overseer of Dyeing, Monument Mills, Housatonic, Mass.
*Rasche, William A.	III	
Snelling, Fred N.	II	With American Express Co., Haverhill, Mass.
Stewart, Walter L.	III	Cotton Goods Converter, Charles Kohlman & Co., Inc., New York City.
xWilson, John S.	II	With H. Banendahl & Co., New York City.

Certificate Holders

Bennett, Edward H.	V	Publisher, F. P. Bennett and Co., Inc., New York City.
Campbell, Louise P.	IIIIb	Designer, Winchester, Mass.
Holgate, Benjamin	V	See Day, 1902.

Name	Course	Occupation
Hutton, Clarence	III	See Evening, 1900.
Petty, George E.	I-V	Secretary and Treasurer, Sampson Power Co., Clinton, N. C.
Pradel, Mrs. A. J. (Walker)	IIIb	Woonsocket, R. I.
Reynolds, Isabel H.	III-V	Clerk, Arlington Mills, Lawrence, Mass.
xRobinson, William C.	III-V	With Russell Mfg. Co., Middletown, Conn.
xSpiegel, Edward	V	In business, New York City.
Stevenson, Murray R.	III-V	Common Sense Gum Co., New York City.

Evening Course, 1903

Certificate Holders

Adams, Henry S.	IIa	Treasurer, The Springstein Mills, Chester, S. C.
Balmforth, James H.	IIa	Postal Clerk, P. O., Bloomfield, N. J.
Barry, Edward J.	IIIa	Overseer, Jackson Company, Nashua, N. H.
xBastow, Henry	IIIa	Textile Inspector, Quartermaster's Dept., Philadelphia, Pa.
Baxter, Alvah J.	IIa	Clerk, Wood Worsted Mills, Lawrence, Mass.
Byam, Walter S.	VI	Clerk, Saco-Lowell Shops, Lowell, Mass.
Cady, Dennis J.	V	Loomfixer, Washington Mills, Lawrence, Mass.
Donnellan, Frank T.	V	See Evening, 1902.
Flynn, John J.	VI	Assistant Engineer, City of Lowell Fire Dept., Lowell, Mass.
French, Mrs. Martha B. (Balmforth)	IIIa	Lowell, Mass.
xGarner, William	IIIa	Foreman of Refinery, Warren Bros. Co., Washington, D. C.
Gaunt, Alfred C.	IIa	See Evening, 1899.
Goodchild, George	Ia	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Gray, Finley M.	VI	Clerk, Merrimack Mfg. Co., Lowell, Mass.
xHiggins, James A.	IIa	Spinner, Talbot Mills, No. Billerica, Mass.
Howard, John	IIIa	See Evening, 1900.
Hunter, Ralph	V	See Evening, 1901.
Jennings, James J.	IIIa	Overseer of Weaving, Salmon Falls Mfg. Co., Salmon Falls, N. H.
Johnson, Samuel L.	V	Overseer, Weaving, Walworth Bros., Lawrence, Mass.
xKeleher, John J.	IIb	Overseer, Drawing Dept., Prospect Mill, Lawrence, Mass.
Knowles, Frank E.	Ia	Inspector, Factory Mutual Insurance Co., Boston, Mass.
xLawrence, Charles	Ia	Overseer, Mule Spinning, Dartmouth Corp., New Bedford, Mass.
Leach, Joseph W.	V	Designer, Pacific Mills, Lawrence, Mass.
Lincourt, Hector L.	VI	Tool Designer and Draftsman, United Shoe Machinery Co., Beverly, Mass.
Lord, Wilfred	IIb	See Evening, 1901.
xMason, Frederick A.	Ia	Mule Spinner, Saxony Worsted Mills, Newton, Mass.
Moir, Alexander L.	P. G. IIIa	See Evening, 1899.

Name	Course	Occupation
Mortenson, Carl W.	IIIa	North Billerica, Mass.
*Mozley, Arthur	VI	
Myers, James W.	IIIa-IV	Assistant Superintendent, U. S. Bunting Co., Lowell, Mass.
Nicholson, Richard	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
xNoonan, Denis T.	IIIa	Assistant Superintendent, Knoxville Woolen Mills, Knoxville, Tenn.
Palmer, G. Buel	IIIa	Salesman, Stanford, Crowell Co., Ithaca, N. Y.
Rockwell, Henry D.	IIa	Clerk, Davis and Furber Machine Co., No. Andover, Mass.
xSchofield, John S.	IIIa	Assistant Superintendent and Designer, Lawrence Keegan Mill, Wilsonville, Conn.
Schoon, Fenton	IIb	Section Hand, Worsted Drawing, Farr Alpaca Co., Holyoke, Mass.
xStokham, Burton I.	IV	Chemist, Bigelow Carpet Company, Lowell, Mass.
xTonge, Matthew	IIIa	Weaver, Dartmouth Mfg. Co., New Bedford, Mass.
Upton, Frank A.	Ia	Assistant Superintendent, Renfrew Mfg. Co., Adams, Mass.
Varney, Manley H.	Ia	See Evening, 1902.
Walker, David	P. G. IIIa	See Evening, 1902.

Day Course, 1904

Diploma Graduates

Abbott, Edward M.	II	Vice-President and Agent, Abbott Worsted Co., Graniteville, Mass.
Baldwin, Frederick A.	II	Vice-President and Secretary-Treasurer, Walter Blue & Co., Ltd., Sherbrooke, P. Q., Canada.
Clapp, F. Austin	II	Of Samuel H. Crawford & Co., New York City.
xClogston, Raymond B.	IV	Superintendent, Farwell Bleachery, Lawrence, Mass.
Culver, Ralph F.	IV	Manager, Dyeing Departments, J. R. Bancroft & Sons Co., Wilmington, Dela.
xCutler, Benjamin W., Jr.	III	With W. H. Hinchman and Co., New York City.
Dewey, James F.	II	Superintendent, Dewey's Mills, Quechee, Vt.
Donald, Albert E.	II	Assistant Superintendent, Uxbridge Worsted Co., Uxbridge, Mass.
Jury, Alfred E.	IV	Chemist, Wells and Richardson Company, Burlington, Vt.
Lucey, Edmund A.	II	Industrial Engineer, H. L. Gantt, New York City.
MacPherson, Wallace A.	III	First Assistant Designer, National & Providence Worsted Mills, Providence, R. I.
Meadows, William R.	I	Assistant Instructor, Carding and Spinning, Clemson Agricultural College, Clemson College, S. C.

Name	Course	Occupation
Stevens, Dexter	I	Vice-President and General Manager, Necronsett Mills, Philadelphia, Pa.
Webb, Frank H.	IV	Chemist, Washington Mills, Lawrence, Mass.
White, Royal P.	II	Superintendent, Stirling Mills, Lowell, Mass.

Certificate Holders

xHalsell, Elam R.	I-V	Overseer of Carding, Warren Mfg. Co., West Warren, Mass.
Horsfall, George G.	II-III-V	Assistant Dyer, Interwoven Mills, Inc., Martinsburg, W. Va.
Jones, Everett A.	III	Superintendent, Nye and Wait Carpet Co., Auburn, N. Y.
xO'Donnell, John D.	I-V	Clerk, Travers Bros. Co., New York City.
xO'Hara, William F.	IV	Chemist, Arthur Merritt, Boston, Mass.
Parker, Everett N.	I-III-V	Manufacturer, Parker Spool and Bobbin Company, Lewiston, Me.
Smith, Ralston F.	I	Sales Manager, The Corday and Gross Co., Cleveland, Ohio.
xToovey, Sidney E.	V	Pattern Dresser and Weaver, Talbot Mills, No. Billerica, Mass.
*Wilson, Walter E. H.	I-V	

Evening Course, 1904

Certificate Holders

xAdams, Michael E.	VI	Local Manager, Lowell Storage Warehouse Co., Lowell, Mass.
Balmforth, James H.	IIa-b	See Evening, 1903.
xBalmforth, William F.	VI	No. Billerica, Mass.
xBarker, John P.	V	Peacedale, R. I.
Barrington, John A.	IV	Salesman, Kalle & Co., Boston, Mass.
xBoucher, John L.	VI	Lowell, Mass.
xButler, Benjamin O.	VI	Lowell, Mass.
xCallahan, Patrick A.	VI	With Lower Pacific Mills, Lawrence, Mass.
Cheetham, John Joseph	Ia	Second Hand, Massachusetts Cotton Mills, Lowell, Mass.
Conley, Frederick A.	VI	Picker Expert, Saco-Lowell Shops, Kitson Plant, Lowell, Mass.
Connors, Edward F.	VI	Draftsman, Locks and Canals, Lowell, Mass.
Davis, Prentice T.	Ia	Overseer, D. Mackintosh & Sons Co., Holyoke, Mass.
xDelmage, Edward R.	IIIa	Overseer Weaving, Thos. Kent Mfg. Co., Clifton Heights, Pa.
Dempsey, John W.	IIa	Photographer, The Dempsey Studio, Ayer, Mass.
xDonahue, Michael F.	VI	Boston, Mass.
Doole, George L.	VI	Clerk, U. S. Bunting Co., Lowell, Mass.
Dooley, Edward W.	VI	Sign Writer, The Kimball System, Lowell, Mass.
Duggan, Francis P.	VI	Assistant Shipping Clerk, U. S. Cartridge Co., Lowell, Mass.
xFrank, Emil M.	IIIa	Cloth Inspector, Ayer Mills, Lawrence, Mass.

Name	Course	Occupation
Gaunt, Alfred C.	IIb	See Evening, 1899.
Hempel, Frank	V	Signal Dept., Boston & Maine Railroad, Lawrence, Mass.
Higgins, James A.	IIa-b	See Evening, 1903.
Hoyle, Joseph	IIb	Overseer, U. S. Worsted Co., No. Chelmsford, Mass.
Jeannotte, Arthur	VI	Lowell, Mass.
Kershaw, William E.	V	Monotype Machinist, Courier-Citizen Co., Lowell, Mass.
Langevin, Felix D.	VI	Superintendent, Kitson Division, Saco-Lowell Shops, Lowell, Mass.
xLord, Harry D.	IIIa	Lowell, Mass.
Lord, Wilfred	IIa	See Evening, 1901.
xMcBride, Robert G.	IIa	Mule fixer, Merrimack Woolen Mills, Lowell, Mass.
Merrill, Edwin C.	VI	Assistant Engineer, Eng. Dept., City Hall, Lawrence, Mass.
Miller, Emil H.	V	Charge of Supply Dept., Lower Pacific Mills, Lawrence, Mass.
Moorehouse, Thomas	VI	Electrician, Everett Mills Power Station, Lawrence, Mass.
Murphy, John H.	VI	Secretary, Board of Trade, Lowell, Mass.
Notman, Frederick W.	Ia	Clerk, Massachusetts Cotton Mills, Boston, Mass.
xPatrick, Alexander	IIIa	Omaha, Neb.
Redman, Henry S.	IIIa	Assistant Superintendent, Appleton Co., Lowell, Mass.
xReed, Foster C. K.	VI	Steam Engineer, Farwell Bleachery, Lawrence, Mass.
xRhodes, Joseph E.	V	Chicago, Ill.
Rooney, George W.	Ia	Superintendent, Cotton Yarn Mill, N. H. Spinning Mills Co., Penacook, N. H.
Shaw, James	V	Loomfixer, Lowell, Mass.
xSmith, Edward	Ia	Fall River, Mass.
Smith, John W.	IIb	Automobile Machinist, Peerless Motor Car Company of New England, Boston, Mass.
xSterling, Walter	IIIa	New Bedford, Mass.
Stokham, Burton I.	P. G. IV	See Evening, 1903.
xTarpey, John F.	IIa	With Merrimack Mfg. Co., Lowell, Mass.
Thompson, Charles B.	VI	Clerk, B. and M. Railroad, Lowell, Mass.
Webb, Francis H.	V	With H. R. Barker Co., Lowell, Mass.

Day Course, 1905

Diploma Graduates

Adams, Henry S.	I	See Evening, 1903.
Boyd, George A.	I	Accountant, Harmony Mills and Chicopee Mfg. Co., Boston, Mass.
Carr, George E.	I	Foreman, Wyoming Valley Lace Mills, Wilkesbarre, Pa.
Cole, James T.	II	Superintendent, Industrial Dept., Mass. Commission for Adult Blind, Cambridge, Mass.
xDillon, James H.	III	With Walworth Bros., Boston, Mass.

Name	Course	Occupation
Harris, Charles E.	I	President and General Manager, Harris Garage and Machine Co., Easthampton, Mass.
Hollings, James L.	I	Examiner of Cottons, U. S. Appraisers Dept., New York City.
Hook, Russell W.	IV	Chemist, Arthur D. Little, Inc., Boston, Mass.
Jones, Everett A.	III	See Day, 1904.
Lewis, Walter S.	IV	Assistant Physicist and Chief of Textile Division, National Bureau of Standards, Washington, D. C.
McKenna, Hugh F.	IV	Chemist, United Indigo and Chemical Co., Ltd., Chicago, Ill.
Midwood, Arnold J.	IV	Salesman, Levinstein and Company, Boston, Mass.
Moore, Everett B.	I	Manager and Buyer, Chadbourne and Moore, Chelsea, Mass.
Parker, Everett N.	I	See Day, 1904.
Thompson, Everett L.	I	Treasurer, The Direct Hosiery Co., Boston, Mass.
Warren, Philip H.	II	Superintendent, Hopeville Mfg. Co., Worcester, Mass.
Wheelock, Stanley H.	II	Superintendent, Stanley Woolen Company, Uxbridge, Mass.

Certificate Holders

Arundale, Henry B.	II-III-V	Director, Textile School, So. Manchester, Conn.
Conklin, Jennie G.	IIIb	Commercial Designer, Boston, Mass.
Curtis, William L.	II	With G. E. & H. F. Habich Co., Boston, Mass.
xHunt, Chester L.	III	Machinist, United Shoe Machinery Co., Beverly, Mass.
Lee, William H.	V	Overseer, Lee's Wool Shop, Holyoke, Mass., and Springfield, Mass.
Roberson, Pat H.	I	With James R. Roberson and Son, Cropwell, Ala.
Roberts, Carrie J.	IIIb	Designer, Lowell, Mass.
xThomas, Roland V.	I	Lowell, Mass.
Wright, Edward, Jr.	II	Sanitary Engineer, Mass. State Board of Health, Boston, Mass.

Evening Course, 1905

Certificate Holders

xBake, Herbert	IIIa	Designer, Walworth Brothers, Lawrence, Mass.
Bastow, Henry	V	See Evening, 1903.
Bell, Frederick W.	IIa	Machinist, U. S. Cartridge Co., Lowell, Mass.
Bowie, Samuel A.	VI	Chief Engineer, Pacific Mills, Lawrence, Mass.
xBrown, James P.	IIIa	Insurance Agent, Metropolitan Life Insurance Co., Lowell, Mass.
Bryant, Ernest L.	VI	Clerk, C. A. Templeton, Inc., Waterbury, Conn.

Name	Course	Occupation
xBurke, Thomas F.	Ia	Lowell, Mass.
Burns, Edward J.	IV	Tester, U. S. Cartridge Company, Lowell, Mass.
Burns, James E.	IV	Overseer, Testing Dept., U. S. Cartridge Co., Lowell, Mass.
xCaron, Cleophas	Ia	Overseer, Ring Spinning Dept., Queen City Cotton Co., Burlington, Vt.
Collins, John A.	IIa-b	Secretary, Mutual Boiler Insurance Company, Boston, Mass.
Cook, Cheney E.	IIIa	Manager, Winslow Bros. and Smith Company, Norwood, Mass.
Custer, James J. E.	V	Letter Carrier, Lowell, Mass.
Dana, Clarence A.	VI	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Dick, Hugo P.	IIIa	Designer, Tilton Mills, Valley Falls, R. I.
*Dimlick, Benjamin C.	IIIa	
Erbe, Gustave	VI	Foreman, J. L. Thomason Mfg. Company, Roberts, Mass.
Foster, Sherwood L.	Ia	Lowell, Mass.
xFrench, Ernest J.	Ia	Clerk, Upper Pacific Mills, Lawrence, Mass.
xGay, Earle B.	Ia	Second Hand Carding, Dana Warp Mills, Westbrook, Me.
Goodchild, George	VI	See Evening, 1903.
Harder, Elmer E.	VI	Janitor, Highland School, Lowell, Mass.
Haven, George W.	IIIa	Of Blake and Stearns, Boston, Mass.
Howard, Thomas	V	Overseer, T. Martin and Bro. Mfg. Co., Lowell, Mass.
xHunt, Herbert R.	VI	Assistant Draftsman, DeLamar's Copper Refining Co., Chrome, N. J.
xHunton, Lewis G.	IV	Shipping Clerk, C. I. Hood Co., Lowell, Mass.
xKenworthy, Joseph	Ia	Second Hand, Boott Mills, Lowell, Mass.
Kimball, Irving D.	VI	With Saco-Lowell Shops, Lowell, Mass.
Lamson, George F.	VI	See Day, 1900
Linkletter, Alfred C.	VI	Linkletter, P. E. I.
xLovell, Charles E.	VI	Los Angeles, Cal.
xMcManus, Hugh	V	With Middlesex Co., Lowell, Mass.
Maguire, James H.	VI	Foreman, Erecting, Saco-Lowell Shops, Lowell, Mass.
*Martin, John C., Jr.	IIa-b	
Molloy, Andrew	IIIa	See Evening, 1902.
O'Neill, Peter F.	IV	Superintendent, Standard Processing Co., Chattanooga, Tenn.
xOverend, John	V	Hand Dresser, Arlington Mills, Lawrence, Mass.
Redman, Henry S.	V	See Evening, 1904.
Silk, Frederick C. M.	IV	Color Passer and Pattern Starter, Bigelow Carpet Co., Lowell, Mass.
xSimola, Emil J.	IIa-b	Finland.
xSkinner, Clarence W.	IIIa	With Brightwood Mfg. Co., No. Andover, Mass.
Smith, Arthur	IIIa	Designer, Pemberton Mills, Lawrence, Mass.
xSmith, George A.	IIIa	Superintendent, Tremont Worsted Co., Methuen, Mass.

Name	Course	Occupation
xSmith, William E.	IIIa	Clerk, Kennedy & Co., Lawrence, Mass.
Stevens, Frank W.	VI	Assistant Engineer, Locks & Canals, Lowell, Mass.
Stopherd, William H.	IIIa	See Evening, 1899.
Tonge, John	IV	Salesman, Dyestuffs and Chemicals, Read, Holliday & Sons, Ltd., Providence, R. I.
Wilde, Thomas E.	IIa	Proprietor, Jeremiah Clark Machinery Co., Lowell, Mass.
xWiswall, Frank T.	V	Cost Clerk, Geo. E. Kunhardt, Lawrence, Mass.

Day Course, 1906

Diploma Graduates

*Avery, Charles H.	II	
Bradford, Roy H.	II	Assistant Superintendent, Smith and Dove Mfg. Company, Andover, Mass.
Churchill, Charles W.	III	Vice-President and Treasurer, The Granby Elastic Web Co., Ltd., Granby, Quebec, Canada.
Cole, Edward E.	IV	Reporter, Bradstreet Co., Boston, Mass.
Currier, Herbert A.	I	Cotton Yarn Salesman, William Whitman & Co., New York City.
Curtis, Frank M.	I	Salesman, Wm. Curtis Sons Co., Boston, Mass.
Fleming, Frank E.	IV	Asst. Dyer and Finisher, Goodall Worsted Co., Sanford, Me.
Gahm, George L.	II	Superintendent, Wood Worsted Mills, Lawrence, Mass.
Hennigan, Arthur J.	II	New England Representative, Talbot Mills, Boston, Mass.
Swan, Guy C.	II	Chemist, Eaton & Philbrick, San Francisco, Calif.
Varnum, Arthur C.	II	Assistant Superintendent, Stirling Mills, Lowell, Mass.
Wightman, William H.	IV	Salesman, Farbenfabriken of Elberfeld Co., Boston, Mass.
Wood, Herbert C.	I	Overseer, Carding, Holmes Mfg. Co., New Bedford, Mass.

Certificate Holders

Church, Charles R.	II-V	Santa Monica, Calif.
Gillon, Sara A.	IIIb	Designer, Lowell, Mass.
xHildreth, Harold W.	II-V	Section Hand, Arlington Mills, Lawrence, Mass.
xHintze, Thomas F.	I	New York City.
xKent, Clarence L.	III-V	Insurance Agent, Mass. Mutual Life Ins. Co., Lawrence, Mass.
xLane, John W.	I	With Everett Mills, Lawrence, Mass.
xMcDonnell, William H.	I-V	South Boston, Mass.
xNewcomb, Guy H.	IV	Mgr. Badische Co., San Francisco, Cal.
Reynolds, Isabel H.	P. G. III-V	See Day, 1903.
Stohn, Alexander C.	III-V	Assistant Superintendent, C. Stohn, Hyde Park, Mass.

Name	Course	Occupation
xWoodruff, Charles B.	V	Traveling Salesman, Hargadine-McKittrick Dry Goods Co. of St. Louis, Mo., Birmingham, Ala.

Evening Course, 1906

Certificate Holders		
Abbott, Paul W.	Ia	Chief Inspector, Cadillac Motor Car Co., Detroit, Mich.
Amiot, Louis H.	Va	American Hide and Leather Co., Lowell, Mass.
Armstrong, Elias B.	IIb	With Wellington, Sears & Co., Boston, Mass.
Bake, Herbert	P. G. IIIa	See Evening, 1905.
xBrouder, John J.	IIIa	Designer, Ayer Mills, Lawrence, Mass.
Brown, James P.	P. G. IIIa	See Evening, 1905.
Brown, William G.	IIb	President, Geo. C. Moore Wool Scouring Mills and Brookside Worsted Mills, No. Chelmsford, Mass.
Burgess, Joseph H.	Va	Cloth Inspector, Arlington Mills, Lawrence, Mass.
Burnham, Joseph W.	IIIa	Designer, Lincoln Mills, Pascoag, R. I.
Burnham, Wilmont V.	Vb	With Wood Worsted Mills, Lawrence, Mass.
Dick, Hugo P.	P. G. IIIa	See Evening, 1905.
xDickson, Andrew	IIa	Asst. Shipping Clerk, Coronet Worsted Co., Mapleville, R. I.
*Dimlick, Benjamin C.	P. G. IIIa	
Dodge, Frank	Ia	Overseer, Hamilton Mfg. Co., Lowell, Mass.
xDuce, Benjamin	IIIa	Overseer, Weaving, Ayer Mills, Lawrence, Mass.
Ellis, George W.	VII	Superintendent, A. D. Ellis & Sons, Monson, Mass.
xEyers, John T.	IV	Second Hand, Dychouse, Bay State Mills, Lowell, Mass.
Frank, Emil M.	P. G. IIIa	See Evening, 1904.
xFulton, John M.	V	Lowell Bleachery, Lowell, Mass.
Gregson, Robert B.	Va	Foreman, American Optical Co., Southbridge, Mass.
xHaigh, William	Vb	Boott Mills, Lowell, Mass.
Hartwell, Henry E.	VI	Student, Massachusetts College of Osteopathy, Cambridge, Mass.
Hoessler, Carl, Jr.	IIIa	Overseer, Weaving, M. T. Stevens & Son, No. Andover, Mass.
Howard, John	IIa	See Evening, 1900.
xHutton, Harold	V	With N. E. Bunting Co., Lowell, Mass.
xHutton, John M.	Vb	With N. E. Bunting Co., Lowell, Mass.
xInberg, Magnus	Ia	Fitchburg, Mass.
Johnson, Ernest A.	V	See Evening, 1902.
xKidd, Thomas E.	IV	Boston, Mass.
xLaffert, August W.	IIIa	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
xMcCarthy, Joseph F.	IIIa	Cloth Examiner, Wood Worsted Mills, Lawrence, Mass.
McLaughlin, Peter J.	Ia	Second Hand, Mass. Cotton Mills, Lowell, Mass.

Name	Course	Occupation
McLay, John	Vb	Agent, Valley Worsted Mills, Providence, R. I.
Maguire, James H.	Ia	See Evening, 1905.
Michelmores, Harry	IIIa	Asst. Designer, Brightwood Mfg. Co., No. Andover, Mass.
Molloy, Andrew	P. G. IIIa	See Evening, 1902.
Morton, Albert N.	IIf	Head of Department, Saco-Lowell Shops, Lowell, Mass.
Murphy, Cornelius D.	IIa	Savannah, Ga.
Nelson, Ernest H.	IIIa	See Evening, 1900.
O'Brien, David A.	IV	Manager, Hall & Lyon Co., Holyoke, Mass.
Pedler, William A.	Ia	Superintendent, Cotton Department, Arlington Mills, Lawrence, Mass.
Pihl, Christian E.	VI	Master Mechanic, Appleton Mills, Lowell, Mass.
Pittendreigh, John M.	Ia	Erector, Saco-Lowell Shops, Charlotte, N. C.
Reardon, Timothy H.	VI	Instructor, Industrial School, Lowell, Mass.
Reynolds, Eugene A.	VI	With Lawrence Mfg. Co., Lowell, Mass.
xRichards, Francis G.	IIa	Wool Sorter, Arlington Mills, Lawrence, Mass.
xRushworth, Walter	VI	Electrician, Girard Bros., Boston, Mass.
Schubert, George J.	V	Second Hand, Pemberton Co., Lawrence, Mass.
xSenior, George	Va	Seattle, Wash.
Sharpe, John R.	VI	Overseer, Saco-Lowell Shops, Lowell, Mass.
Sheppard, Byron H.	VI	Draftsman, The Rhode Island Co., Providence, R. I.
xSilk, Patrick E.	VII	Second Hand, Finishing, Beaver Brook Mills, Collinsville, Mass.
Skinner, Clarence W.	P. G. IIIa	See Evening, 1905.
Smith, Arthur	P. G. IIIa Va	See Evening, 1905.
Smith, George A.	P. G. IIIa	See Evening, 1905.
Smith, William E.	P. G. IIIa	See Evening, 1905.
Stopherd, William H.	P. G. IIIa	See Evening, 1899.
xVogt, Harry A.	Vb	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
xWalker, William, Jr.	VII	Assistant to Superintendent, Ottaqueche Woolen Co., No. Hartland, Vt.
Ward, James J.	VII	Pressman, Lowell Fertilizer Co., Lowell, Mass.
*Whitcomb, Harry E.	Ia	

Day Course, 1907

	Diploma	Graduates
Arundale, Henry B.	II	See Day, 1905.
xComan, James G.	I	Director, Mississippi Textile School, Agricultural College, Miss.
Craig, Albert W.	IV	In Laboratory, Pacific Mills, Lawrence, Mass.
Farmer, Chester J.	IV	Professor of Chemistry, Marquette University, School of Medicine, Milwaukee, Wis.

Name	Course	Occupation
xHaskell, Spencer H.	II	Worcester, Mass.
Hathorn, George W.	IV	Chemist, Lawrence Gas Co., Lawrence, Mass.
Hildreth, Harold W.	II	See Day, 1906.
xHoyt, Charles W. H.	IV	Second Hand, Dyeing, Merrimack Mfg. Co., Lowell, Mass.
Knowland, Daniel P.	IV	Chemist, Geigy-ter-Meer, New York City.
Mackay, Stewart	III	Instructor, Textile Design and Cloth Analysis, Lowell Textile School, Lowell, Mass.
Merriman, Earl C.	II	With Samson Cordage Works, Shirley, Mass.
Raymond, Charles A.	IV	In charge of Heating Coke Ovens, N. E. Gas and Coke Company, Everett, Mass.
Storer, Francis E.	II	Clerk, National Shawmut Bank, Boston, Mass.
*Stursberg, Paul W.	II	
Woodcock, Eugene C.	II	Superintendent of Carding, Chelsea Fibre Mills, Brooklyn, N. Y.

Certificate Holders

xBrannen, Leon V.	III-V	Philadelphia, Pa.
xEhrenfried, Jacob B.	II-V	With George Ehrenfried Co., Lewiston, Me.
Lane, John W.	I-V	See Day, 1906.
Parker, Mrs. Lotta (Meek)	IIb	Lewiston, Me.

Evening Course, 1907

Certificate Holders

xAckroyd, Theodore C.	IIb	Chicago, Ill.
xBain, William A.	VII	Color Chemist, C. Bischoff & Co., New York City.
Bake, Herbert	VII	See Evening, 1905.
Ballinger, Frederick W.	IIb	Second Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Barber, James E.	IIb	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Barraclough, John C.	Ia	Clerk, Arlington Mills, Lawrence, Mass.
Bastow, Stephen W.	IV	Overseer of Bleaching, Winship, Boit and Co., Wakefield, Mass.
Bayard, Pierre P.	IIIa	General Manager and Director, Cie Parisienne de Rouse, Puteaux, France.
Begen, Thomas W.	IIb	Overseer, Washington Mills, Lawrence, Mass.
xBenoit, William A.	Va	Second Hand, Everett Mills, Lawrence, Mass.
xBouille, Arthur L.	Vb	Washington Mills, Lawrence, Mass.
Brannen, Leon V.	IIa	See Day, 1907.
Brouder, John J.	VII	See Evening, 1906.
xBucklitsch, Gustave J.	IIb	Overseer of Combing, Valley Worsted Mills, Providence, R. I.
Burgess, Joseph H.	Vb	See Evening, 1906.
Butterworth, Charles A.	Va	Assistant Paymaster, Suncook Mills, Suncook, N. H.
xButterworth, John A.	IIb	With J. W. Coggeshall, Providence, R. I.
Carden, Francis E.	IIb	Lowell, Mass.

Name	Course	Occupation
Carlson, Ernest B.	IIb	Student, Lowell Textile School, Lowell, Mass.
Dick, Hugo P.	IIb	See Evening, 1905.
Dobbs, William	IIb	Second Hand, Mass. Mohair Plush Co., Lowell, Mass.
Dodge, Charles P.	IIa	Machinist, C. S. Dodge, Lowell, Mass.
Duce, Benjamin	VII	See Evening, 1906.
Flint, Leon G.	IIIa	Finished Percher, Washington Mills, Lawrence, Mass.
xFrechette, Alphonse J.	IIb	Clerk, W. Gendron, Lawrence, Mass.
xGillespie, James E.	VII	Wet Finishing, Brightwood Mfg. Company, No. Andover, Mass.
Gregson, Robert B.	Ia-Vc	See Evening, 1906.
Haartz, John C.	VII	President and Treasurer, W. A. and J. C. Haartz, Boston, Mass.
xHaas, Ignatius	Ia	New York City.
Hamblett, Harry A.	Ia	Overseer, Merrimack Mfg. Co., Lowell, Mass.
Hanglin, Albert J.	IV	
xHanglin, William E.	Vb	Worcester, Mass.
Hebert, Charles L. J.	IV	In business, Lowell, Mass.
xHitchen, Harry S.	Vb	Lowell, Mass.
xHitchen, Thomas G.	Vb	Manchester, N. H.
Howard, John	VII	See Evening, 1900.
xIgnatius, Pentti	Va	Appleton Co., Lowell, Mass.
Jepson, Harry	Vb	With U. S. Bunting Co., Lowell, Mass.
Kelly, Michael H.	IIIa	See Evening, 1902.
xKirsch, Alfred O.	Vb	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Laffert, August W.	VII	See Evening, 1906.
Lake, William F.	IIIa	Overseer, Middlesex Co., Lowell, Mass.
xMarjerison, T. Sydney	IIIa	Clerk, Lower Pacific Mills, Lawrence, Mass.
Martin, Willard E.	IIIa	Salesman, W. H. Gardner & Co., Boston, Mass.
Michelmores, Harry	VII	See Evening, 1906.
Myers, James W.	VII	See Evening, 1903.
xNelson, Charles E.	IIb	With Sugden Press Bagging Co., No. Chelmsford, Mass.
O'Brien, Michael F.	IIb	Bigelow Carpet Co., Lowell, Mass.
Porter, George K., Jr.	IIIa	Salesman, Wellington, Sears & Co., San Francisco, Calif.
Read, Paul A.	VII	Superintendent, Barnaby Mfg. Co., Fall River, Mass.
Redman, Henry S.	Ia	See Evening, 1904.
*Ritter, Alfred E.	IIb	
Robbins, John	IIb	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Senior, George	Ia-Vc	See Evening, 1906.
Skinner, Clarence W.	VII	See Evening, 1905.
Smith, Arthur	Vc	See Evening, 1905.
Smith, Ernest B.	Vb	East Side Mill & Lumber Co., Selwood, Portland, Oreg.
xSmith, James	Vb	Loom Fixer, Wood Worsted Mills, Lawrence, Mass.
xSmith, Percy H.	Vb	Washington Mills, Lawrence, Mass.
Smith, William E.	VII	See Evening, 1905.

Name	Course	Occupation
Varnum, Arthur C.	Vb	See Day, 1906.
xWahlberg, Einar S.	Ia	Fitchburg, Mass.
Waterworth, Frank W.	Vb	With Ayer Mill, Lawrence, Mass.
Webb, Francis H.	IIIa	See Evening 1904.
xWebber, John F.	IIIa	Style Man, Converting Dept., Marshall Field & Co., Chicago, Ill.
xWhittaker, Thomas B.	IIb	Clerk, Arlington Mills, Lawrence, Mass.
Wiggin, Leon M.	IIIa	Designer, U. S. Bunting Co., Lowell, Mass.
Wolf, William C.	Va	Loom Fixer, Pacific Mills, Lawrence, Mass.
xWolger, John J.	IIIa	Loom Fixer, Methuen Co., Methuen, Mass.
xYare, John F.	Vb	Middlesex Co., Lowell, Mass.

Day Course, 1908

	Diploma	Graduates
Abbott, George R.	II	Andover, Mass.
Ballard, Horace W. C. S.	IV	Chemist and Overseer of Dyeing, Felters Co., Millbury, Mass.
Dwight, John F., Jr.	II	Cochituate, Mass.
Farr, Leonard S.	II	Overseer, Farr Alpaca Co., Holyoke, Mass.
Gay, Olin D.	II	Superintendent, Gay Bros. Co., Cavedish, Vt.
Hadley, Walter E.	IV	Research Chemist, Roessler & Hasslacher Chemical Co., Perth Amboy, N. J.
Huising, Geronimo H.	I	Examiner of Textiles, Bureau of Customs, Manila, P. I.
*Jenckes, Leland A.	VI	
Lewis, LeRoy C.	IV	Statistician, Bigelow Carpet Co., Lowell, Mass.
Mailey, Howard T.	II	With Lower Pacific Mills, Lawrence, Mass.
Perkins, Joshua D.	III	Overseer, Worsted Spinning, Amoskeag Mfg. Co., Manchester, N. H.
xPrince, Sylvanus C.	VI	Lowell, Mass.
Proctor, Braman	IV	Dyestuffs Salesman, Badische Co., Boston, Mass.
Reynolds, Fred B.	II	Purchasing Agent, M. T. Stevens and Sons Co., No. Andover, Mass.
Robinson, Ernest W.	IV	Overseer, Belding Bros. & Co., and Chemist, Rock Mfg. Co., Rockville, Conn.
Weinz, W. Elliot	IV	Chemist, American Felt Co., Boston, Mass.
Wingate, William H.	IV	Chemist, Sidney Blumenthal and Co., Shelton, Conn.

Evening Course, 1908

	Certificate	Holders
Arnold, Warren H.	VII	Second Hand, U. S. Bunting Co., Lowell, Mass.
xBarrington, James L.	Iv	Salesman, Kalle and Co., Philadelphia, Pa.
Begen, Thomas W.	IIb	See Evening, 1907.

Name	Course	Occupation
Berry, Alfred H.	VI	Electrical Engineer, Silesia Worsted Mills, No. Chelmsford, Mass.
Broadbent, James H.	Vb	With U. S. Bunting Co., Lowell, Mass.
xBroadbent, William	Vb	Lawrence, Mass.
Brown, James T.	IIIa	Section Hand, Wood Worsted Mills, Lawrence, Mass.
Buckley, Harry	IV	Overseer, Warp Dyeing, Arlington Mills, Lawrence, Mass.
Campbell, Archibald	IV	In charge of Department, United Drug Laboratories Co., Boston, Mass.
Carden, Francis E.	IIb	See Evening, 1907.
xCarney, William J.	Ia	Section Hand, Arlington Mills, Lawrence, Mass.
xCarter, Charles R.	Vb	Weaver, Washington Mills, Lawrence, Mass.
xCorr, Eben W.	Vb	With Prudential Life Ins. Co., Lawrence, Mass.
Corr, James F.	Vb	Loomfixer, Bay State Mills, Lowell, Mass.
Craven, Harry	VII	Clerk, Pacific Mills, Lawrence, Mass.
Dick, Hugo P.	Vb	See Evening, 1905.
Dixon, Arthur	IIIa	Loomfixer, American Woolen Co., Methuen, Mass.
Dobbs, William	IIb	See Evening, 1907.
Dunn, George C.	IIIa	Lowell, Mass.
Flynn, William J.	Vb	Lowell, Mass.
Greenhalge, James	Vc	Second Hand, Indian Head Mfg. Co., Nashua, N. H.
xHallbauer, William R.	Vb	At Washington Mills, Lawrence, Mass.
Hanson, Edward	IIIa	Overseer, Merrimack Mfg. Co., Lowell, Mass.
xHardman, David B.	IV	Machine Printer, Pacific Mills, Lawrence, Mass.
xHarris, Louis	VII	Assistant to Clothing Designer, J. Peavey and Bros., Boston, Mass.
Hennessey, Ambrose M.	VII	Inspector of Transformers, General Electric Co., Pittsfield, Mass.
Hill, Harold	Ia	Section Hand, Arlington Mills, Lawrence, Mass.
xHoellrich, Martin J.	Vb	With Wood Worsted Mills, Lawrence, Mass.
Ingham, Benjamin W.	Ia	Overseer, Boott Mills, Lowell, Mass.
xLagerbald, Jarl	VII	Asst. Chemist, Wood Worsted Mills, Lawrence, Mass.
Lake, William F.	P. G. IIIa	See Evening, 1907.
McGill, William E.	VII	Second Hand, Linn Woolen Co., Hartland, Me.
xMcGovern, James	VII	Cloth Inspector, Arlington Mills, Lawrence, Mass.
McKenna, Jeremiah J.	Vb	With Merrimack Woolen Co., Dracut, Mass.
Maker, Isaac A.	Ia	Draftsman, Lawrence Mfg. Co., Lowell, Mass.
Marjerison, T. Sydney	P. G. IIIa	See Evening, 1907.
xMarshall, Fred K. R.	VI	Electrician, Arlington Mills, Lawrence, Mass.
Mortenson, Carl W.	IIa	See Evening, 1903.
Nutter, James R.	VI	With Merrimack Mfg. Co., Lowell, Mass.

Name	Course	Occupation
*Osbeck, William J.	IIIa	
xPatterson, Alfred H.	IIIa	Clerk, Lower Pacific Mills, Lawrence, Mass.
xPerkins, Thomas, Jr.	Ia	Superintendent, Chicopee Mfg. Co., Chicopee Falls, Mass.
Picken, William T.	IIIa	Purchasing Agent and Paymaster, Silesia Worsted Mills, No. Chelmsford, Mass.
Plumer, Paul T.	Vb	Cloth Inspector, U. S. Bunting Co., Lowell, Mass.
Porter, George K., Jr.	P. G. IIIa	See Evening, 1907.
Preble, George A.	IIIa	Overseer, Massachusetts Cotton Mills, Lowell, Mass.
xSaalfrank, Joseph C.	IIIa	Chief Clerk, Top Mill Dept., Arlington Mills, Lawrence, Mass.
Scally, Edward	VI	With Wm. Scally, Lowell, Mass.
Schermerhorn, George E.	Va	See Evening, 1902.
Schuster, William F.	VII	Second Hand, Washington Mills, Lawrence, Mass.
Seddon, N. Graham	IIIa	Manager, Einstein Mfg. Co., Brooklyn, N. Y.
Seiple, Alexander	IIIa	Student, Mt. Hermon School, Mt. Hermon, Mass.
Shackleton, J. Henry	IV	Overseer, Dyeing, Pemberton Mills, Lawrence, Mass.
Simoneau, Verner W.	VI	Student, Baltimore Medical College, Baltimore, Md.
Spurr, Albert R.	VII	Finisher, Atlantic Mills, Providence, R. I.
Spurr, James H., Jr.	IV	Assistant Bacteriologist, State Board of Health Experimental Station, Lawrence, Mass.
xStewart, Charles	Va	Weaver, Tremont and Suffolk Mills, Lowell, Mass.
Teichmann, Alfred A.	Vb	With Wood Worsted Mills, Lawrence, Mass.
Tucker, John T.	Ia	Clerk, Saco-Lowell Shops, Lowell, Mass.
Varnum, Arthur C.	P. G. IIIa	See Day, 1906.
Webber, John F.	P. G. IIIa	See Evening, 1907.
Whittaker, Thomas B.	IIb	See Evening, 1907.
Wiggin, Leon M.	P. G. IIIa	See Evening, 1907.
xWillgeroth, Henry J.	IIIa	Asst. Designer, Wood Worsted Mills, Lawrence, Mass.
Wilmot, Joseph	IIIa	Instructor, Weaving Dept., Lowell Textile School, Lowell, Mass.
Wolf, William C.	Vb	See Evening, 1907.
Wood, Jonathan	Va	See Evening, 1902.
xYoung, Richard, Jr.	Va	Loomfixer, Tremont and Suffolk Mills, Lowell, Mass.

Day Course, 1909

Diploma Graduates

Brainerd, Arthur T.	IV	Salesman, Farbwerke Hoechat Co., Chicago, Ill.
Conant, Harold W.	I	With Conant, Houghton & Co., Littleton, Mass.

Name	Course	Occupation
Fairbanks, Almonte H.	II	Treasurer, Middlesex Knitting Co., Reading, Mass.
Ferguson, William G.	III	Asst. Purchasing Agent, Ludlow Mfg. Associates, Ludlow, Mass.
Fiske, Starr H.	II	Assistant Superintendent, Garland Woolen Co., Staffordville, Conn.
Gyzander, Arne K.	IV	Second Hand, Faulkner & Colony Mfg. Co., Keene, N. H.
Holden, Francis C.	IV	Dyer, Chelsea Fibre Mills, Brooklyn, N. Y.
Kay, Harry P.	II	Foreman of Finishing, T. H. Taylor Co., Ltd., Chatham, Ont., Canada.
Laughlin, James K.	III	Traveling Salesman, Parks and Woolson Machine Co., Springfield, Vt.
Levi, Alfred S.	IV	Assistant Superintendent, Liondale Bleach, Dye and Print Works, Rockaway, N. J.
xMason, Archibald L.	VI	Foreman, Champlain Silk Mills, Brooklyn, N. Y.
Mullen, Arthur T.	II	Designer, Sutton's Mills, No. Andover, Mass.
Newall, J. Douglas	IV	Second Hand, Dyehouse, Pacific Mills, Lawrence, Mass.
xParkis, William L.	I	Boss Comber, Sharp Mfg. Co., New Bedford, Mass.
Pease, Chester C.	I	Superintendent, Yarn Mill, Shaw Stocking Co., Lowell, Mass.
Potter, Carl H.	I	Efficiency Engineer, Amoskeag Mfg. Co., Manchester, N. H.
Prescott, Walker F.	IV	Assistant Superintendent, American Felt Co., Hyde Park, Mass.
Saunders, Harold F.	IV	Chemist, Pacific Mills, Lawrence, Mass.
Stone, Ira A.	IV	Buyer, Royal Waste Co., Boston, Mass.
Wood, J. Carleton	IV	Fabric Expert, The Goodyear Tire and Rubber Co., Akron, Ohio.

Evening Course, 1909

Certificate Holders

Anderson, Carl A.	IV	Machinist, Lenox Motor Co., Boston, Mass.
Arnold, Warren H.	IIIa	See Evening, 1908.
xBailey, Rothwell	Va	With Mass. Cotton Mills, Lowell, Mass.
Bake, Herbert	P. G. IIIa	See Evening, 1905.
Banks, Jonas	Va	Fancy Loomfixing, Hamilton Mfg. Co., Lowell, Mass.
Barr, Mrs. John E. (Butler, Elizabeth M.)	IIIb	Lowell, Mass.
Benoit, Benjamin L.	VIb	Bookkeeper, Bay State Mills, Lowell, Mass.
xBooth, Arthur	IIIa	Clerk, Arlington Mills, Lawrence, Mass.
Bowen, Herbert E.	IIIa	Overseer, Middlesex Co., Lowell, Mass.
Buckley, Richard A.	Vb	With U. S. Bunting Co., Lowell, Mass.
Bunce, Raymond H.	Vb	Salesman, American Woolen Co., Brooklyn, N. Y.
Carman, William	Va	Fixer, Tremont and Suffolk Mills, Lowell, Mass.

Name	Course	Occupation
xChesworth, Frank K.	Va	With Everett Mills, Lawrence, Mass.
xCockell, Frederick H.	IIIa	Poultryman, J. Lord, No. Andover, Mass.
Cowdrey, Charles E.	Vb	See Evening, 1902.
xDavison, Frank L.	Vb	With Talbot Mills, No. Billerica, Mass.
Dulligan, Charles E.	VIa	Overseer, U. S. Cartridge Co., Lowell, Mass.
xDunning, Carlos W.	VIb	With Appleton Co., Lowell, Mass.
Gaunt, Ernest H.	IIIa	Manager Mercantile Service, Babson's Statistical Organization, Wellesley Hills, Mass.
Gilinson, Philip J.	VIa	Experimental Work, Heinze Electric Co., Lowell, Mass.
xGordon, Herbert E.	IIIa	Clerk, Arlington Mills, Lawrence, Mass.
Hanson, Edward	P. G. IIIa	See Evening, 1908.
xHayes, Michael C.	IIa	In business, No. Billerica, Mass.
Hill, Harold	Va	See Evening, 1908.
Hillier, Arthur P.	IIb	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Hodgkins, Albert A.	VII	Superintendent, A. & E. H. Henckels, Bridgeport, Conn.
xHolt, Harry C.	VIa	Electrician, Mass. Cotton Mills, Lowell, Mass.
xHouston, William I.	IIIa	Weaver, Washington Mills, Lawrence, Mass.
xHowell, Edward A.	Va	Loomfixer, Pemberton Mills, Lawrence, Mass.
xJoyce, John	Vc	Weaver, Merrimack Mfg. Company, Lowell, Mass.
Kaler, Harold F.	VIb	In Assembling Dept., General Electric Co., Lynn, Mass.
Kelley, Bernard J., Jr.	VIc	With B. Joseph Kelley, New York City.
Kershaw, Benn	Va	Overseer, Boott Mills, Lowell, Mass.
Lincourt, Henry E.	VIb	With Stover & Bean, Lowell, Mass.
McClure, Charles G.	VIb	With Heinze Electric Co., Lowell, Mass.
McLay, John	IIb	See Evening, 1906.
Madden, Peter	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Mahoney, Dennis J.	Vb	With Talbot Mills, No. Billerica, Mass.
Molloy, Andrew	P. G. IIIa	See Evening, 1902.
Musard, Albert E., Jr.	Vc	With Lowell Textile Co., No. Chelmsford, Mass.
Nelson, Ernest H.	Ia	See Evening, 1900.
Orrell, Frank L.	VIb	Second Hand, Mass. Mohair Plush Co., Lowell, Mass.
Palmer, G. Buel	Vb	See Evening, 1903.
Paquin, Joseph	VIa	Machinist, U. S. Government, Schofield Barracks, N. H.
xParsons, Joseph G.	IIIa	Pattern Weaver, Thos. Kitson & Son, Stroudsburg, Pa.
xPearson, Fred	VIa	Machinist, Saco-Lowell Shops, Lowell, Mass.
Read, Paul A.	Va	See Evening, 1907.
Robinson, Thomas	Ia	Foreman, Boott Cotton Mills, Lowell, Mass.
Ryan, Edward P.	Ia	Lowell, Mass.
Schubert, George J.	IIIa	See Evening, 1906.

Name	Course	Occupation
Schuerfeld, Harry W.	IIIa	Salesman, C. U. Thomas and Co., Boston, Mass.
Smith, Arthur	P. G. IIIa	See Evening, 1903.
Smith, George A.	VII	See Evening, 1903.
Smith, William E.	P. G. IIIa	See Evening, 1903.
Stocks, Carl W.	VIa	Statistician, American Electric Railway Assn., New York City.
Stopherd, William H.	P. G. IIIa	See Evening, 1899.
*Sullivan, Humphrey F.	Ia	
Sykes, Alvin E.	VIa	Shipping Clerk, Saco-Lowell Shops, Lowell, Mass.
Tucker, John T.	Va	See Evening, 1908.
Varnum, Arthur C.	VII	See Day, 1906.
Vogt, Alfred H.	IIb	See Evening, 1902.
xWalsh, Michael L.	Ia	Section Hand, Appleton Co., Lowell, Mass.
Ware, Edward W.	IIIa	With Wellington, Sears & Co., Boston, Mass.
xWatson, Luther F.	IIb	Clerk, Arlington Mills, Lawrence, Mass.
xWeigel, Frederick A.	VIb	Machinist, Pacific Mills, Lawrence, Mass.
Young, Richard, Jr.	Vc	See Evening, 1908.

Day Course, 1910

	Diploma	Graduates
Arienti, Peter J.	IV	Chemist, Wanskuck Co., Providence, R. I.
Cary, Julian C.	VI	With American Mutual Liability Ins. Co., Boston, Mass.
Clark, Thomas T.	II	Treasurer, Talbot Mills, No. Billerica, Mass.
Duval, Joseph E.	II	Assistant Superintendent, Mass. Mohair Plush Co., Lowell, Mass.
Finlay, Harry F.	IV	Color Chemist, American Dyewood Co., New York City.
Fletcher, Roland H.	VI	Littleton Common, Mass.
xGale, Harry L.	III	Designer, West, Baker & Co., New York City.
Goldberg, George	VI	Malden, Mass.
xHardy, Philip L.	VI	Construction Work, L. E. Locke, South Lawrence, Mass.
Howe, Woodbury K.	I	With Amoskeag Mfg. Co., Manchester, N. H.
Hurtado, Leopoldo, Jr.	VI	General Manager, Hurtado and Co., Uruapan, Mich., Mexico.
Jelleme, William O.	I	Head of Test Department, Brighton Mills, Passaic, N. J.
Keough, Wesley L.	II	Assistant Dyer, Massachusetts Mohair Plush Co., Lowell, Mass.
Lamb, Arthur F.	II	Manager, Rockland Cleaning & Dyeing Co., Rockland, Me.
McCool, Frank L.	IV	Color Chemist, Cassella Color Co., Boston, Mass.
Manning, Frederick D.	IV	Experimental Chemist, C. W. Haselton & Co., Haverhill, Mass.
Murray, James A.	II	With Talbot Clothing Co., Boston, Mass.

Name	Course	Occupation
Nichols, Raymond E.	VI	Cost Accountant, Lowell Bleachery, Lowell, Mass.
Putnam, Leverett N.	IV	Dyer, Franklin Mills, Franklin, Mass.
Reed, Norman B.	I	Investigator, Smith and Dove Mfg. Co., Andover, Mass.
Robson, Frederick W. C.	IV	Dyer, Hamilton Cotton Co., Hamilton, Ont.
Smith, Doane W.	II	Designer, Somerset Woolen Co., Monson, Mass.
Smith, Theophilus G., Jr.	IV	Groton, Mass.
Stronach, Irving N.	IV	Dyer, Aberfoyle Mfg. Co., Chester, Pa.
Whitcomb, Roscoe M.	IV	Manager, Hinsdale Drug Co., Hinsdale, Mass.

Evening Course, 1910

Certificate Holders

Anderton, Harry	Va	Loomfixer, Massachusetts Cotton Mills, Lowell, Mass.
xAtkinson, Norman	Vb	Lawrence, Mass.
xBailey, Carl E.	Ia	Assistant Superintendent, Stark Mills, Manchester, N. H.
Banks, Jonas	Vc	See Evening, 1909.
xBerry, Percy W.	Vb	Finisher, Ayer Mills, Lawrence, Mass.
xBourchard, Ethan J.	Vc	Loomfixer, Merrimack Mfg. Co., Lowell, Mass.
xBourchard, Robert R.	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Burgess, Joseph H.	IIIa	See Evening, 1906.
Campbell, Edward G.	VIc	In Real Estate Business, Lowell, Mass.
Christison, Hugh	IV	Chemist's Assistant, Arlington Mills, Lawrence, Mass.
Cox, Edward J.	IIa	Cost Finder, Merrimack Mfg. Co., Lowell, Mass.
Cutress, Albert J.	VId	Machinist, Saco-Lowell Shops, Lowell, Mass.
xDeely, John A.	Vb	Pittsfield, Mass.
xDuckett, Fred I.	Vb	Section Hand, Washington Mills, Lawrence, Mass.
Dulligan, Lawrence F.	VIa	Machinist, Vulcan Iron Works, Seattle, Wash.
Dunn, George C.	IVa	See Evening, 1908.
xEklund, Louis V.	Vb	With Merrimack Woolen Co., Dracut, Mass.
Fielding, Fred	Vc	With Merrimack Mfg. Co., Lowell, Mass.
Flemings, Lester A.	Va	Paymaster, Bay State Mills, Lowell, Mass.
Flynn, John	VId	Toolmaker, Kitson Plant, Saco-Lowell Shops, Lowell, Mass.
xFlynn, Patrick	Vb	With Bay State Mills, Lowell, Mass.
Fujiyoshi, Heisayu	Ia	Student, Graduate School of Business Administration, Harvard College, Cambridge, Mass.
Gaspar, Edith E.	IIIb	Clerk, Lawrence Hosiery, Lowell, Mass.
Gauthier, William	Vb	With U. S. Bunting Co., Lowell, Mass.
Gookin, Alice L.	IIIb	Teacher, City of Lowell, Lowell, Mass.

Name	Course	Occupation
Hering, Paul C.	IIIa	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Hibbert, George E.	Va	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
xHill, Ellsworth O. C.	IIf	Assistant Superintendent, Yarn Dept., Wood Worsted Mills, Lawrence, Mass.
Hilliard, William B.	VIa	Foreman, American Watch Tool Co., Waltham, Mass.
Hird, Arthur W.	Ia	Overseer, Lawrence Mfg. Co., Lowell, Mass.
Hird, James A.	IVa	Chemist, B. & M. and N. Y., N. H. & H. R. R., Boston, Mass.
Hodgkins, Albert A.	IIIa	See Evening, 1909.
Hoellrich, Martin J.	Vc	See Evening, 1908.
xHolt, Gavin O.	IVa	Designer, Boott Mills, Lowell, Mass.
Houston, William I.	Vb	See Evening, 1909.
Hunton, John H.	VII	Treasurer, Newichawanick Co., So. Berwick, Me.
Hurtado, Leopoldo, Jr.	Vc	See Day, 1910.
Hutton, Thomas V.	Vb	Fireman, Lowell Electric Light Corporation, Lowell, Mass.
Jackson, Frank	VIb	With Monomac Mills, Lawrence, Mass.
Jean, Adhemard C.	VIa	Inspector, Line Dept., Bay State Street Railway Co., Lowell, Mass.
Jordan, Frederic W.	IV	Draftsman, Smith and Brooks, Lowell, Mass.
xJorde, Linville T.	VIc	Cable Splicing, N. E. Tel. & Tel. Co., Dover, N. H.
Kershaw, Benn	Vc	See Evening, 1909.
Kershaw, Samuel S.	IIf	Second Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
xKrause, George	VII	Assistant Finisher, Arlington Mills, Lawrence, Mass.
LaJeunesse, Joseph A.	IVa	Clerk, A. G. Pollard Co., Lowell, Mass.
Leck, Arthur J.	VII	Analyzer of Fabrics, Earl & Wilson, Troy, N. Y., and Instructor of Textile Fabrics, The Troy Central School, Troy, N. Y.
Ledoux, Blanche H.	IIIb	With A. G. Pollard Co., Lowell, Mass.
Lemire, Arthur	Ia	Overseer, Renfrew Mfg. Co., Adams, Mass.
McAuliffe, Patrick D.	VIb	In Business, Lowell, Mass.
McElroy, Samuel H.	Vb	With Heinze Electric Co., Lowell, Mass.
Mabbett, Albert L.	IIIa	Assistant Superintendent and Designer, Newport Woolen Co., Newport, Me.
Maxcy, Leo M.	VIc	Foreman, F. E. Jewett and Co., Lowell, Mass.
xMessiah, Hiram G.	Vb	With G. A. Rogers Bakery, Reading, Mass.
Nelson, Ernest H.	Vc	See Evening, 1900.
Nelson, Gustave A.	Vb	With T. Martin and Bro., Lowell, Mass.
Nichols, Clarence W.	Vb	With Alfred Kimball Shoe Co., Lawrence, Mass.
Nicoll, John	IVa	Overseer, Smith and Dove Mfg. Co., Andover, Mass.
Paquin, Joseph	VIb	See Evening, 1909.
Petterson, Birger	VIa	Master Mechanic, Lowell Bleachery, Lowell, Mass.
Phelps, Mary I.	IIIb	Teacher, City of Lowell, Lowell, Mass.

Name	Course	Occupation
Redman, Henry S.	IV	See Evening, 1904.
Robinson, Thomas	Vc	See Evening, 1909.
Root, Francis X., Jr.	IIIa	Loomfixer, Hamilton Co., Lowell, Mass.
Shackleton, John H.	Ia	See Evening, 1908.
Stewart, William W.	IV	Overseer of Dyeing, Barnaby Mfg. Co., Fall River, Mass.
Stopherd, William H.	VII	See Evening, 1899.
Stott, Bertram S.	Vb	Loomfixer, Geo. E. Kunhardt, Lawrence, Mass.
Stott, Samuel	IV	Dyer, Arlington Mills, Lawrence, Mass.
xSullivan, Michael F.	VIIb	With Merrimack Woolen Co., Dracut, Mass.
xDodd, Henry	VII	With Farwell Bleachery, Lawrence, Mass.
Welch, Benjamin L.	VIIb	Installer, N. E. Tel. & Tel. Co., Central Office, Lowell, Mass.
Whitman, William P.	IVa	Second Hand, Farwell Bleachery, Lawrence, Mass.
Whitney, Frederick A.	IV	Dyer, John P. Boyd Co., Williamstown, Mass.
Williams, Allen R.	Ia	Clerk, Amoskeag Mfg. Co., New York City.
Worthington, John A.	Ia	Manager of Warehouse, Vacuum Oil Co., Burlington, Vt.

Day Course, 1911

Diploma Graduates

Adams, Tracy A.	IV	Second Hand in Dyehouse, Pacific Mills, Lawrence, Mass.
xBailey, Walter J.	IV	Manager, Bailey's Cleansers and Dyers, Watertown, Mass.
Blaikie, Howard M.	II	Assistant to Styler and Salesman, American Woolen Co., New York City.
Cameron, Elliott F.	IV	With New England Casualty Co., Boston, Mass.
Chandler, Proctor R.	IV	Chemist, Loose-Wiles Biscuit Co., Boston, Mass.
Chisholm, Lester B.	I	Efficiency Manager, T. Martin & Bro. Mfg. Co., Chelsea, Mass.
Dewey, Maurice W.	II	Of Peck Brothers Co., Montpelier, Vt.
Flynn, Thomas P.	IV	Assistant Dyer, New York Mills Bleachery, New York Mills, N. Y.
Ford, Edgar R.	IV	Finisher, Saylesville Bleachery, Saylesville, R. I.
Gainey, Francis W.	IV	Second Hand, Dyehouse, Pacific Mills, Lawrence, Mass.
Hay, Ernest C.	II	With Monomac Spinning Co., Lawrence, Mass.
Hendrickson, Walter A.	II	Superintendent and Secretary, Middlesex Knitting Co., Reading, Mass.
Hubbard, Ralph K.	IV	Superintendent, Squam Lake Woolen Co., Ashland, N. H.
Hunton, John H.	II	See Evening, 1910.
Martin, Harry W.	IV	Quality Man, Hood Rubber Co., Watertown, Mass.

Name	Course	Occupation
Merrill, Allan B.	IV	Chemist, B. F. Goodrich Co., Akron, Ohio.
Moore, Karl R.	IV	With Wood Worsted Mills, Lawrence, Mass.
O'Connell, Clarence E.	IV	Second Hand in Dyehouse, Boston Mfg. Co., Waltham, Mass.
Pearson, Alfred H.	IV	Section Hand, Dyehouse, Goodall Worsted Co., Sanford, Me.
Rich, Everett B.	III	Manager, Profile and Flume Hotels Co., Profile House, N. H.
Sidebottom, Leon W.	IV	Second Hand, Dyehouse, Appleton Co., Lowell, Mass.
Standish, John C.	IV	Chemist and Dyer, F. C. Huyck and Sons, Albany, N. Y.
Toshach, Reginald A.	II	Designer, M. T. Stevens and Sons Co., Haverhill, Mass.
Walker, Alfred S.	II	With Saxonville Mills, Saxonville, Mass.
Watson, William	III	With F. E. Watson, Haverhill, Mass.
Wood, Ernest H.	IV	Assistant Instructor, Department of Biological Chemistry, Marquette University School of Medicine, Milwaukee, Wis.

Evening Course, 1911

Certificate Holders

Andrews, Oliver	Ia-Va	Salesman, Wellington, Sears & Co., New York City.
Ballinger, William E.	I Ib	Chauffeur, E. A. Rider, Worcester, Mass.
x Barnes, Joseph	Ia	Second Hand, Smith and Dove Mfg. Co., Andover, Mass.
Bastow, Percy	IVa	Warp Mercerizer, Arlington Mills, Lawrence, Mass.
Birkby, Charles H.	IVa	Overseer of Dyeing, J. & J. Dobson, Philadelphia, Pa.
Brown, William F.	VIb	Master Mechanic, U. S. Worsted Co., Lowell, Mass.
Burke, James F.	Vc	With Bigelow Carpet Co., Lowell, Mass.
Carpilio, John A.	VIa	With Alfred Kimball Shoe Co., So. Lawrence, Mass.
Carty, Thomas P.	Vb	With Bigelow Carpet Co., Lowell, Mass.
Christison, Hugh	IVd	See Evening, 1910.
Cochrane, John	VIb	Electrician, Lowell Gas Light Co., Lowell, Mass.
Cote, George W.	VIb	With Shaw Stocking Co., Lowell, Mass.
Cox, Edward J.	Va	See Evening, 1910.
Dean, Hubert R.	VIb	Draftsman, Arlington Mills, Lawrence, Mass.
Delaney, Michael J.	Vb	With Dumas and Co., Lowell, Mass.
x Dodge, Ernest W.	Vb	Lowell, Mass.
Downs, John F.	VI d	With Heinze Electric Co., Lowell, Mass.
Dulligan, Thomas	VIa	With U. S. Cartridge Co., Lowell, Mass.
Flaherty, William	Vb	With Faulkner's Mill, No. Billerica, Mass.
Fournier, Albert A.	Ia	Overseer, Renfrew Mfg. Co., Adams, Mass.
Fujiyoshi, Heisayu	Va	See Evening, 1910.

Name	Course	Occupation
Gakidis, Alexander N.	IVa	Proprietor, The Arsculapius Pharmacy, Manchester, N. H.
Garrity, Joseph F.	VIId	Machinist, Tremont & Suffolk Mills, Lowell, Mass.
Glennon, Edward M.	IVa	Assistant Dyer, Dana Warp Mills, Westbrook, Me.
Goodwin, Ross	Vb	With Heinze Electric Co., Lowell, Mass.
Gustafson, Alfred L.	IVa	With J. J. Mullaney, Lowell, Mass.
Handley, John M.	Vb	With Musketaquid Mills, Lowell, Mass.
xHanslip, Charles W.	Vb	Saugus, Mass.
Hartwell, Marcus H.	Ia-Va	Cost Clerk, Warren Cotton Mills, West Warren, Mass.
Heaton, Forster G.	IV	Overseer of Dyeing, Mayo Woolen Mills, Millbury, Mass.
Herrick, William E.	VII	Overseer, Albany Felt Co., Albany, N. Y.
Hibbert, George E.	Vc	See Evening, 1910.
Hodge, William	VIa	Chief Clerk, Farwell Bleachery, Lawrence, Mass.
Kennedy, William E.	VIa	Lawrence, Mass.
Lachance, Melina	IIIb	With A. G. Pollard Co., Lowell, Mass.
Lemire, Arthur	Va	See Evening, 1910.
Linberg, Joseph F.	IVa	Dyer, Cleveland Wortsed Co., Falconer, N. Y.
xLogan, George H. S.	IV	Dyer, Lewando's Dyeing Co., Watertown, Mass.
McNamara, Thomas	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Manning, James B.	IVa	Dyer, Felters Co., Millbury, Mass.
Marsden, Phillips B.	IVa	Assistant Chemist, Arlington Mills, Lawrence, Mass.
Milot, Joseph E.	VIc	With Saco-Lowell Shops, Lowell, Mass.
Murphy, Howard H.	IIb	In business, Boston, Mass.
Nelson, James A.	Ia	Clerk, R. P. Webster, Lowell, Mass.
xNelson, Sigfred W.	VIId	With Saco-Lowell Shops, Lowell, Mass.
xNewall, Preston	Ia	Overseer, Kosciusko Cotton Mill, Kosciusko, Miss.
Newsholme, Charles E.	VIb	Student, Wentworth Institute, Boston, Mass.
Nichol, Samuel J.	IVa	Dyer, Waterhead Mills, Lowell, Mass.
Nichols, Nathan A.	VIb	Draftsman, The Lamson Co., Lowell, Mass.
Parkin, Prescott R.	Vb	Stock Clerk, General Electric Co., East Boston, Mass.
Pedler, William A.	IVa	See Evening, 1906.
Perron, Francis J.	Vb	With Brightwood Mfg. Co., No. Andover, Mass.
xPerry, Clarence R.	IIb	Assistant Superintendent, Washington Mills, Lawrence, Mass.
Racicot, Marie E.	IIIb	Student, Lowell Textile School, Lowell, Mass.
Robinson, James E.	VII	Finisher, Adams Mfg. Co., Shelton, Conn.
Robinson, Ruddach P.	VII	Paymaster, Beaver Brook Mills, Collinsville, Mass.
Rogers, John F.	Ia	With Calumet and Arizona Smelting Co., Douglas, Ariz.
Rowlands, Harold	Va	Clerk, Massachusetts Cotton Mills, Boston, Mass.
Shaffer, William A.	VIId	Machinist, W. W. Carey, Lowell, Mass.
Shields, John J.	Va	With Appleton Co., Lowell, Mass.

Name	Course	Occupation
Stanley, John R.	IIb	Second Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Stearns, Orlo F.	IVa	With Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C.
Stewart, George	Ia-IVa	Overseer of Dyeing, Massachusetts Cotton Mills, Lowell, Mass.
Tennant, Joseph A.	VIb	In Machine Shop, Washington Mills, Lawrence, Mass.
xWade, Frank J.	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Walton, Frank L.	Ia	Traveling Salesman, Tupelo Cotton Mills, Tupelo, Miss.
Ward, Bernard D.	IIIa	Pattern Weaver, U. S. Bunting Co., Lowell, Mass.
Williams, Allen R.	Va	See Evening, 1910.
Willmott, Herbert J.	VIa	Draftsman, Locks and Canals, Lowell, Mass.
xWollin, Frederick W.	Va	Utica, N. Y.
Wright, Frederick J.	Vb	With Massachusetts Mohair Plush Co., Lowell, Mass.

Day Course, 1912

Diploma Graduates

xBigelow, Prescott F.	II	With Eisemann Bros., Boston, Mass.
Brown, Rollins	IV	With Suncook Mill, Suncook, N. H.
Coan, Charles B.	IV	Dyer, Renfrew Mfg. Co., Adams, Mass.
Conant, Richard G.	I	Salesman, Brighton Mills, Passaic, N. J.
Dalton, Gregory S.	IV	East Walpole, Mass.
Dearth, Elmer E.	IV	Examiner of Textiles, Federal Rubber Mfg. Co., Milwaukee, Wis.
Elliot, Gordon B.	II	With Stanley Woolen Co., Uxbridge, Mass.
Engstrom, Karl E.	VI	Student, Massachusetts Institute of Technology, Boston, Mass.
Frost, Harold B.	II	With Ayer Mills, Lawrence, Mass.
Hassett, Paul J.	IV	Chemist, Remington Typewriter Co., Bridgeport, Conn.
Holmes, Otis M.	VI	Manager of Stock Room, Gardner Gas Co., Gardner, Mass.
Hood, Leslie N.	IV	Assistant Chemist, Glenlyon Dye Works, Saylesville, R. I.
Lamont, Robert L.	II	With Cheney Bros., So. Manchester, Conn.
Leitch, Harold W.	IV	Instructor in Chemistry, Lowell Textile School, Lowell, Mass.
Munroe, Sydney P.	I	With Chicopee Mfg. Co., Chicopee Falls, Mass.
Niven, Robert S.	VI	Draftsman, Crosby Steam Gage and Valve Co., Boston, Mass.
Pottinger, James G.	II	With S. Slater and Sons, Inc., Webster, Mass.
xRoche, Raymond V.	IV	Assistant Chemist, Renfrew Mfg. Co., Adams, Mass.
Rundlett, Arnold D.	VI	With Ayer Mills, Lawrence, Mass.
Shea, Francis J.	II	With George H. Gilbert Mfg. Co., Ware, Mass.

Name	Course	Occupation
Sullivan, John D.	VI	With Haverhill Box Board Co., Bradford, Mass.
Thaxter, Joseph B., Jr.	II	Salesman, Smith and Dove Mfg. Co., Andover, Mass.
Whitehill, Warren H.	IV	Manufacturing Chemist, Brewer and Co., Worcester, Mass.
Yavner, Harry	II	Foreman, Scouring Dept., S. A. Maxwell Co., Bangor, Me.

Evening Course, 1912

Certificate Holders		
Beech, Wilfred	Ia	Second Hand, Lorraine Mfg. Co., Pawtucket, R. I.
Bernard, Joseph E.	VId	Machinist, Saco-Lowell Shops, Kitson Plant, Lowell, Mass.
Blais, Emile	VId	Machinist, Saco-Lowell Shops, Lowell, Mass.
Blanchette, Eugene	IIIb	With Lawrence Mfg. Co., Lowell, Mass.
Boije, Walter F.	IIB-VII	Designer and Draftsman, Whitin Machine Works, Whitinsville, Mass.
Brainerd, Albert C.	Ia	Second Hand, Everett Mills, Lawrence, Mass.
Brainerd, Harry C.	Ia	Second Hand, Lower Pacific Mills, Lawrence, Mass.
xBramley, Charles	Va	With Everett Mills, Lawrence, Mass.
xBroderick, Thomas H.	VII	Material Clerk, Lawrence Dyeworks Co., Lawrence, Mass.
Browne, Charles D.	Ia	Sherman Mfg. Co., Sherman, Texas.
xBurke, George J.	VII	With Merrimack Woolen Co., Dracut, Mass.
Buzzell, Fred S.	IIIa	Second Hand, Arlington Mills, Lawrence, Mass.
Carlson, Goddard O.	VII	Second Hand, Stirling Mills, Lowell, Mass.
Christenson, John O.	VIb	Student, Lowell, Mass.
Clark, John W.	IVa	Assistant Dyer, Puritan Mills, Plymouth, Mass.
Daskalakis, Efthimios Z.	Vb	With Boott Mills, Lowell, Mass.
Dick, Henry K.	Ia	Instructor in Knitting, Lowell Textile School, Lowell, Mass.
Dittman, Ralph A.	IIIa	Assistant Superintendent, The Glazier Mfg. Co., So. Glastonbury, Conn.
Dollbaum, John A.	IIIa	Stonington, Conn.
Donahey, William H.	Vb	Chain Builder, U. S. Bunting Co., Lowell, Mass.
Dulligan, Charles E.	IVa	See Evening, 1909.
Egan, Charles H.	IVa	Oil Chemist, A. D. Little, Inc., Boston, Mass.
Freeman, Ralph W.	IVa	Lowell, Mass.
xFrothingham, Newton S.	Ia	With Merrimack Mfg. Co., Lowell, Mass.
Graves, John F.	VIb	Draftsman, Smith and Brooks, Lowell, Mass.
Greenwood, Ralph F.	VII	Lawrence, Mass.
Hansen, Hans M.	VId	Machinist, U. S. Cartridge Co., Lowell, Mass.

Name	Course	Occupation
Hartshorn, George T.	VII	With American Felt Co., Dolgeville, N. Y.
Hibbert, George E.	Vb	See Evening, 1910.
Higginson, Joseph H.	IIIa	Assistant Superintendent, Pentucket Mills, Haverhill, Mass.
Holland, Walter F.	IIIa	Loomfixer, Washington Mills, Lawrence, Mass.
Hutchings, James C.	VII	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Jackson, Frank	VIId	See Evening, 1910.
Jasper, Grant	Vc	With Bigelow Carpet Co., Lowell, Mass.
Kent, Arthur	VIB	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Kerrigan, Arthur J.	VIa	Chief Timekeeper, Saco-Lowell Shops, Lowell, Mass.
xLambert, Harry	IIB	Section Hand, Arlington Mills, Lawrence, Mass.
Lapierre, Alderic S.	IIIa	Second Hand, Merrimack Mfg. Co., Lowell, Mass.
LaPorte, Philip J.	IVa	Chemist, Lowell Gas Light Co., Lowell, Mass.
Leith, Joseph E.	Vb	Loomfixer, Massachusetts Cotton Mills, Lowell, Mass.
Lockberg, John L.	VIId	Machinist, Saco-Lowell Shops, Lowell, Mass.
Lowe, John C.	IIB	Instructor, Woolen Yarns, Lowell Textile School, Lowell, Mass.
McCann, Martin	Vb	With Merrimack Woolen Co., Dracut, Mass.
Macdonald, Chester W.	VIa	Instructor, Lowell Industrial School, Lowell, Mass.
Michael, Joseph C.	Vb	With George F. White, Lowell, Mass.
Muldoon, Joseph M.	VIB	Mechanical Draftsman, General Electric Co., Lynn, Mass.
*Naylor, Charles	IVa	
Orrell, Frank L.	IIB	See Evening, 1909.
Palm, Carl H.	VIa	Machine Tool Designer, Metz Automobile Co., Waltham, Mass.
xPihl, Ingrid I.	IIIB	Stenographer, Victor Pihl, Lowell, Mass.
Preble, George A.	Va	See Evening, 1908.
xPrescott, William B.	Va	Assistant to Head of Export Department, Grinnell, Willis and Co., New York City.
Redman, Henry S.	VIa	See Evening, 1904.
Riley, Edward T.	IIIa	No. Billerica, Mass.
Rollins, Henry E.	VII	Overseer of Dyeing, Saranac Woolen Co., Blackstone, Mass.
Royds, James	Ia	Foreman Carder, Boott Mills, Lowell, Mass.
Savage, Charles F.	IVa	With Lamson Store Service Co., Lowell, Mass.
Shearer, David D.	VII	With Lawrence Dye Works Co., Lawrence, Mass.
Skidmore, Russell P.	VIB	Draftsman, Lamson Store Service Co., Lowell, Mass.
Smith, William F.	VIId	Machinist, Bigelow Carpet Co., Lowell, Mass.

Name	Course	Occupation
xStevens, Harold S.	IIIa	Of Stevens Shoe Co., Haverhill, Mass.
Stevenson, Robert P.	Ia	Salesman, Wm. V. Threlfall, Boston, Mass.
Sugden, Albert G.	IIIa	Designer, U. S. Bunting Co., Lowell, Mass.
Swanson, Victor E.	IVa	Carbonizer, Stirling Mills, Lowell, Mass.
Taylor, Harold S.	Vib	Clerk, Wing's Market, Lowell, Mass.
Towers, Frederic G.	Ia	Section Hand, Pacific Mills, Lawrence, Mass.
Turgeon, Roderick	IVa	Clerk, Talbot Dyewood and Chemical Co., Lowell, Mass.
xVause, John	Va	With Pacific Mills, Lawrence, Mass.
xWard, Herbert H.	Vb	Gilbertville, Mass.
Webster, Orrin H.	Ia	Assistant Superintendent, Massachusetts Cotton Mills, Lowell, Mass.
Wicks, Frederic M.	IIIa	Second Hand, Pentucket Mills, Haverhill, Mass.
Wilkinson, Joseph	IIIa	Loomfixer, U. S. Bunting Co., Lowell, Mass.
Wood, Arthur S.	Va	With Granby Elastic Web Co., Granby, P. Q.

Day Course, 1913

Degree Graduates

Holmes, Otis M.	VI	Manager of Stock Room, Gardner Gas Co., Gardner, Mass.
Pensel, George R.	IV	Assistant Chemist, S. Slater and Sons, Inc., Webster, Mass.

Diploma Graduates

Bennett, Herbert B.	II	With Catlin and Co., New York City.
Cleary, Charles J.	II	Laboratory Assistant in Textiles, Bureau of Standards, Washington, D. C.
Cook, Kenneth B.	I	Designer, American Mills Co., Waterbury, Conn.
Davieau, Arthur N.	VI	With American Felt Co., Hyde Park, Mass.
Davis, Alexander D.	VI	Student, Lowell Textile School, Lowell, Mass.
Dearborn, Roy	VI	Assistant Engineer, Abbot Academy, Andover, Mass.
Gadsby, Arthur N.	II	Laboratory Assistant, Bureau of Standards, Washington, D. C.
Horton, Chester T.	VI	Student, Lowell Textile School, Lowell, Mass.
Johnson, Arthur K.	IV	With Pacific Mills, Lawrence, Mass.
Mather, Harold T.	VI	Instructor, Textile School, So. Manchester, Conn.
Murray, James	IV	Research Chemist, Nashua Gummed and Coated Paper Co., Nashua, N. H.
Peck, Carroll W.	IV	With Brewer and Co., Worcester, Mass.
Pillsbury, Ray C.	I	Observer, Efficiency Dept., Amoskeag Mfg. Co., Manchester, N. H.
Plummer, Elliott B.	IV	Assistant Instructor, Dyeing, Lowell Textile School, Lowell, Mass.

Name	Course	Occupation
Putnam, Philip C.	IV	Assistant Chemist, S. Slater and Sons, Inc., Webster, Mass.
Richardson, Richardson P.	I	With Empire Cotton Mills, Ltd., Welland, Ont.
Sylvain, Charles E.	VI	Engineer, The Green Fuel Economizer Co., Boston, Mass.
Walen, Ernest D.	VI	Student, Lowell Textile School, Lowell, Mass.

Evening Course, 1913

Certificate Holders

Abbott, Arthur G.	Vb	With Wood Worsted Mills, Lawrence, Mass.
Allen, William J.	IVa	Dyer, Pacific Mills, Lawrence, Mass.
Anderton, Harry	Vb	See Evening, 1910.
Atkinson, Reginald C.	IVa	Laboratory Clerk, Silesia Worsted Mills, No. Chelmsford, Mass.
Bassett, Cyrus J.	Vb	With U. S. Bunting Co., Lowell, Mass.
Beaulieu, William E.	IIb	With Rice and Co., Inc., Lowell, Mass.
Bell, Charles W.	VIa	Electrical Worker, Massachusetts Cotton Mills, Lowell, Mass.
Black, Alexander S.	Vb	Bookkeeper, Pacific Mills, Lawrence, Mass.
Breen, James D.	Vc	Loomfixer, Massachusetts Cotton Mills, Lowell, Mass.
Breen, John P.	Vb	With Bay State Mills, Lowell, Mass.
Butland, Ralph A.	VII	With Washington Mills, Lawrence, Mass.
Buzzell, Fred S.	VII	See Evening, 1912.
Charleton, Peter	VIa	Lowell, Mass.
Clarke, Wesley J.	VId	With Ballardvale Mills Co., Ballardvale, Mass.
Classon, Walter H.	Vc	Loomfixer, Nashua Mfg. Co., Nashua, N. H.
Cote, Fred J.	VIa	With General Electric Co., Lynn, Mass.
Cox, Edward J.	Ia	See Evening, 1910.
Cudmore, Edward T.	VId	Machinist, Merrimack Mfg. Co., Lowell, Mass.
Cushing, Lester H.	Ia	Instructor, Lowell Textile School, Lowell, Mass.
Daskalakis, Efthimios Z.	Vc	See Evening, 1912.
Devine, Mary F.	IVa	Teacher, Public School, Lowell, Mass.
Doyle, John B.	VId	With M. Doyle, Lowell, Mass.
Dunn, George C.	IVb	See Evening, 1908.
Ekengren, Hilding C.	IIIb	Clerk, Dickerman and McQuade, Lowell, Mass.
Forrest, William R.	VId	Lowell, Mass.
Freeman, George D.	VId	Clerk, James E. Freeman, Lowell, Mass.
Giffin, Charles H.	IIIa	Overseer, Merrimack Woolen Co., Dracut, Mass.
Giffin, George R.	IIIa	Assistant Superintendent, Merrimack Woolen Co., Dracut, Mass.
Gile, Harold E.	IVa	Laboratory Assistant, Ayer Mills, Lawrence, Mass.

Name	Course	Occupation
Gordon, Loyd H.	V Ia	Pattern Maker, Saco-Lowell Shops, Lowell, Mass.
Hannagan, Edward F.	IIb	Section Hand, Washington Mills, Lawrence, Mass.
Hanson, Edward	Ia	See Evening, 1908.
Herron, Alexander T.	Ia	Second Hand, Dyeing, Arlington Mills, Lawrence, Mass.
Higgins, Alfred	IIIa	Designer, Lyman Mills, Holyoke, Mass.
Hoelzel, Louis C.	VIa	With Washington Mills, Lawrence, Mass.
Howker, John	Ia	Clerk, Boott Mills, Lowell, Mass.
Innes, Andrew K.	Vb	Clerk, Arlington Mills, Lawrence, Mass.
Jackson, Walter J.	IIa	Assistant to Superintendent, Sutton's Mills, No. Andover, Mass.
Jarvis, Charles	Vb	Overseer, Smith and Dove Mfg. Co., Andover, Mass.
Jones, Herbert	Ia	Overseer, Killingly Mfg. Co., Killingly, Conn.
Kershaw, Samuel S.	Vb	See Evening, 1910.
Kirkpatrick, Lloyd A.	Ia	Master Mechanic, Merrimack Utilization Co., Lowell, Mass.
LaJeunesse, Joseph A.	IVc	See Evening, 1910.
Lambert, Seth	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
Lang, William A.	Vc	Engineer, Lockwood, Greene and Co., Boston, Mass.
Learned, Frank E.	Va	Pattern Weaver, Pemberton Mills, Lawrence, Mass.
Leaver, Raymond J.	V Ib	Draftsman and Assistant Timekeeper, Arlington Mills, Lawrence, Mass.
Leonard, Charles W.	VII	Student, Lowell Textile School, Lowell, Mass.
Lowe, Harry F.	Va	With Merrimack Mfg. Co., Lowell, Mass.
McDonald, William A.	V Ib	Machinist, Saco-Lowell Shops, Lowell, Mass.
McGowan, Annie C.	IIIb	With Lowell Hosiery Co., Lowell, Mass.
McGurn, James P.	VI d	Lowell, Mass.
Maguire, Andrew F.	Vb	With Bigelow Carpet Co., Lowell, Mass.
Manning, James B.	IVb	See Evening, 1911.
Maynard, Wilfred B.	VII	Salesman, Middlesex Co., Lowell, Mass.
Metcalfe, Walter B.	IIb	Second Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Miller, Ernest P., Jr.	Ib	Fitchburg, Mass.
Monahan, Patrick H.	VI d	Machinist, Saco-Lowell Shops, Lowell, Mass.
Murphy, Leo T.	Vc	Assistant Colorist, Bigelow Carpet Co., Lowell, Mass.
Musard, Henry A.	Vc	With American Woolen Co., Collinsville, Mass.
Nelson, Ernest H.	Ib	See Evening, 1900.
Nicoll, John	IVb	See Evening, 1910.
Orrell, Ernest R.	VI d	With W. W. Carey, Lowell, Mass.
Orrell, Frank L.	Vb	See Evening, 1909.
Preble, George A.	Vb-Vc	See Evening, 1908.
Quinn, James H.	VII	Second Hand, Ayer Mills, Lawrence, Mass.
Randall, William O.	IIb	With Wood Worsted Mills, Lawrence, Mass.

Name	Course	Occupation
Redman, Henry S.	Ib	See Evening, 1904.
Redpath, Robert H.	VII	With Brightwood Mfg. Co., No. Andover, Mass.
Reynolds, James J.	Vc	With Bigelow Carpet Co., Lowell, Mass.
Rollins, Sidney R.	IIb	Clerk, Beoli Mills, West Fitchburg, Mass.
Shaw, William	VIa	Draftsman, Saco-Lowell Shops, Lowell, Mass.
Shearer, David D.	Vb	See Evening, 1912.
Sleeper, Robert R.	VII	See Day, 1900.
Soule, William N.	VIc	With Lamson Co., Lowell, Mass.
Sugden, Albert G.	VII	See Evening, 1912.
Sullivan, Michael F.	VIa	See Evening, 1910.
Wainwright, Harold	IVa	Second Hand, Dyeing, Everett Mills, Lawrence, Mass.
Whitman, William P.	IVb	See Evening, 1910.
Wilkinson, Joseph	VII	See Evening, 1912.
Younger, Andrew	IIIa	Assistant to Superintendent, Merrinack Woolen Co., Dracut, Mass.

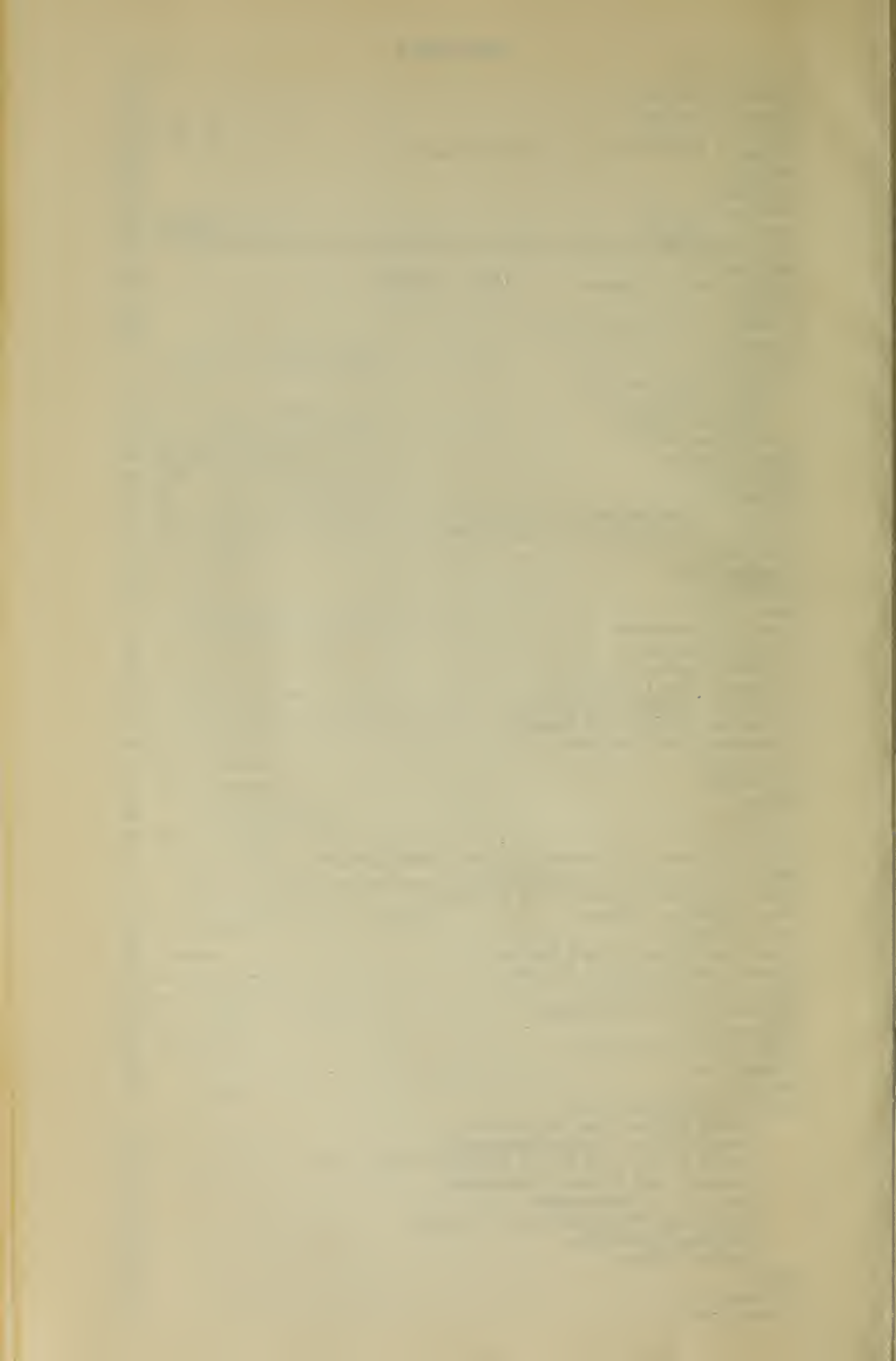
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1899—1913

Directors of Textile Schools	3
Teachers	14
Mill Vice-Presidents	3
Mill Treasurers and Agents	8
Mill Superintendents	22
Mill Assistant Superintendents	11
Mill Foreman of Departments	12
Mill Auditors and Accountants	3
Mill Clerks	2
Second Hands	8
Managers	11
Textile Designers and Fabric Experts	19
In Commission Houses	4
Salesmen	8
Purchasing Agents	2
Chemists, Dyers and Chemical Salesman	48
Electricians	1
Industrial Engineers	8
Mill Engineering	9
In Government Employ	5
In State Employ	1
Trade Journalists	3
In Business, Textile Distributing or Incidental Thereto	10
Textile Manufacturing, Unassigned	22
Other Business	13
Students	6
Married Women	3
Employment Not Known	24
Not Employed	2
Deceased	6
Total	291

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Lowell Textile School

LOWELL, MASS.

Date.....

Name in Full,

Date and Place of Birth,

Home Address, {
City or Town State
.....
Street and Number

Parent or Guardian,

School last attended,

DEGREE COURSES. (Course should be indicated)

- | | |
|--------------------------|-------------------------------------|
| I-4 Textile Engineering | II-4 Chemistry and Textile Coloring |
| 1 General Textile Option | |
| 2 Cotton Option | |
| 3 Wool Option | |

DIPLOMA COURSES. (Course should be indicated)

- | | |
|--------------------------|---------------------------|
| I-3 Cotton Manufacturing | IV-3 Chemistry and Dyeing |
| II-3 Wool Manufacturing | VI-3 Textile Engineering |
| III-3 Textile Design | |
| (General Textile Course) | |

Signature,

ENDORSEMENT BY OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that.....
the above applicant has completed the regular course at the.....
High School, and has satisfactorily passed the following subjects, as specified
on pages 69-81 of Catalogue of 1914-1915, making a total of points.

REQUIRED SUBJECTS. POINTS.

ELECTIVE SUBJECTS. POINTS.

Signed :

Principal..... School, located

at..... State of

Date.....

EVENING APPLICATION BLANK

THIS SHOULD BE FILLED OUT AND SENT TO THE PRINCIPAL

Lowell Textile School

LOWELL, MASS.

DATE.....

I, hereby
apply for admission to the Lowell Textile School as *EVENING*
student.

Name in Full,

Date and Place of Birth,

Home Address, {
City or Town State
.....
Street and Number

Parent or Guardian,

Residence of Parent or Guardian,

School last attended,

(INDICATE COURSE)

- | | |
|--|------------------------------------|
| I. Cotton Spinning. | V. Weaving. |
| II. a—Woolen Spinning. | a—Cotton Weaving. |
| b—Worsted Spinning. | b—Woolen and Worsted Weaving. |
| | c—Dobby and Jacquard Weaving. |
| III. a—Textile Design. | VI. Engineering. |
| b—Freehand Drawing. | a—Elements of Engineering. |
| IV. Chemistry and Dyeing. | b—Mechanical Drawing. |
| a—Elementary Chemistry. | c—Machine Shop. |
| b—Textile Chemistry and Dyeing. | VII. Woolen and Worsted Finishing. |
| c—Analytical Chemistry | |
| d—Textile and Analytical Chem-
istry. | |

Signature,

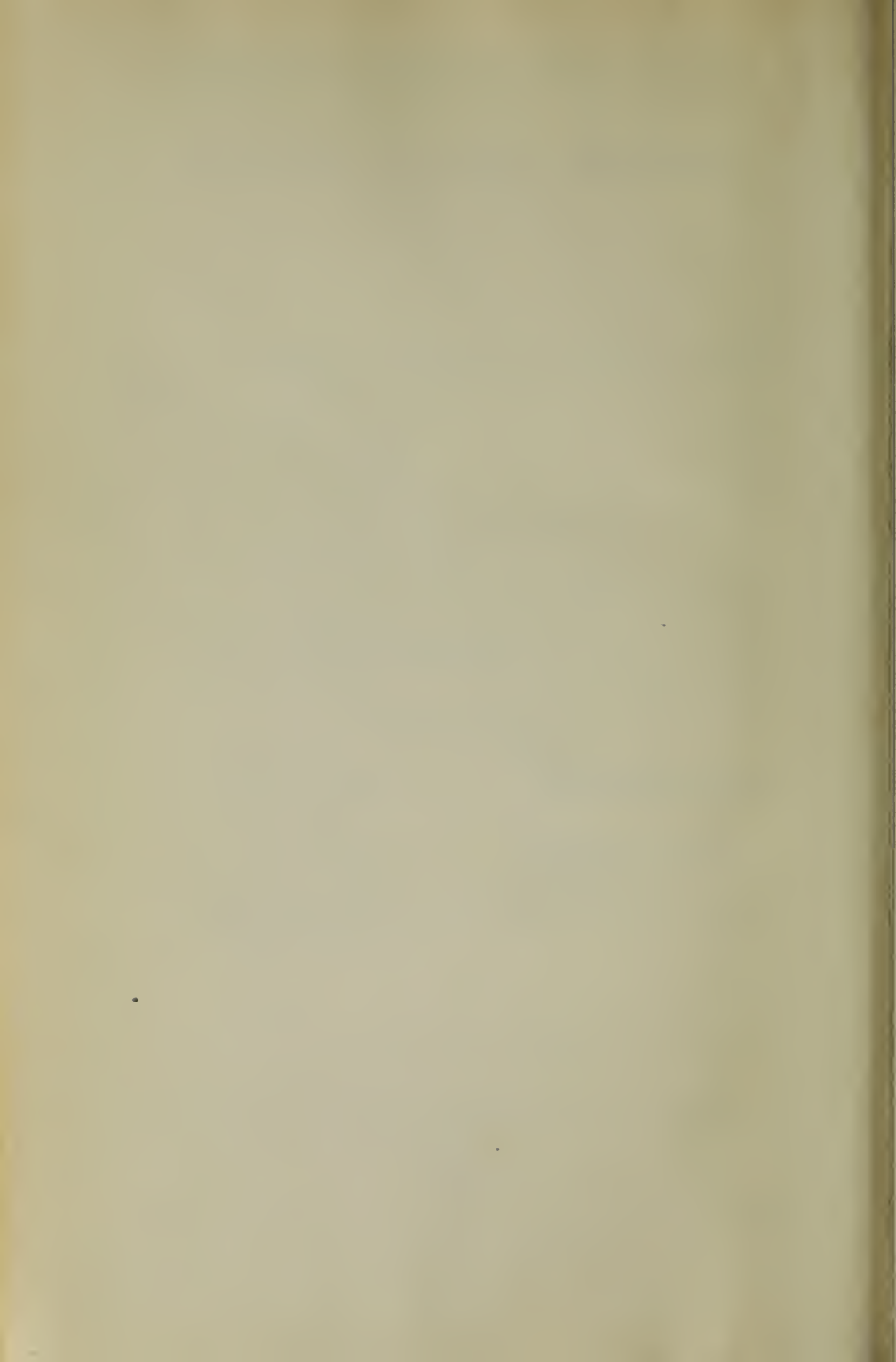
ENDORSEMENT BY SOME OFFICER OF SCHOOL LAST ATTENDED

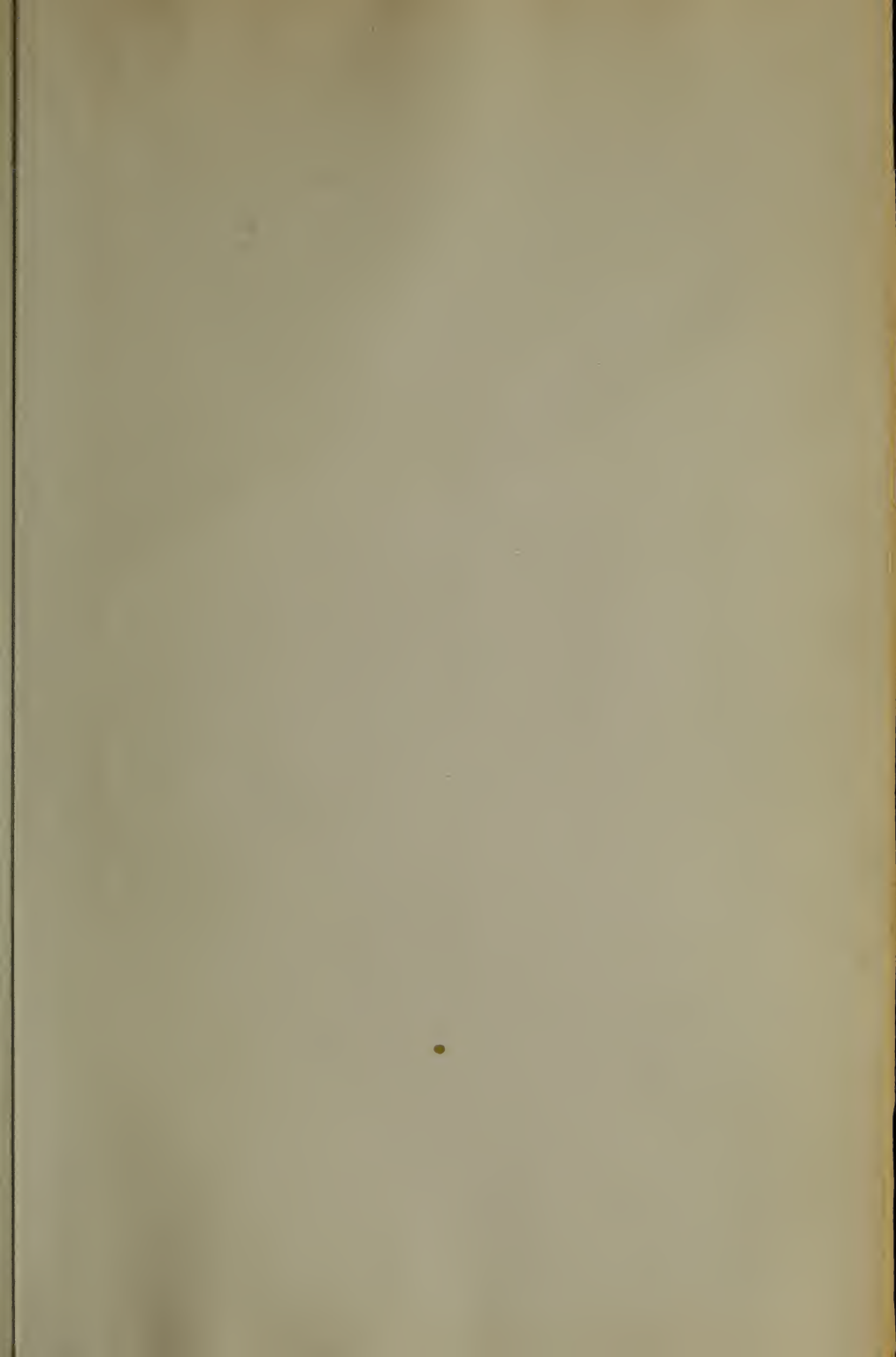
I hereby certify that
the above applicant is duly qualified to pursue with profit the
work of the Lowell Textile School.

SIGNED :

Principal School, located
at State of

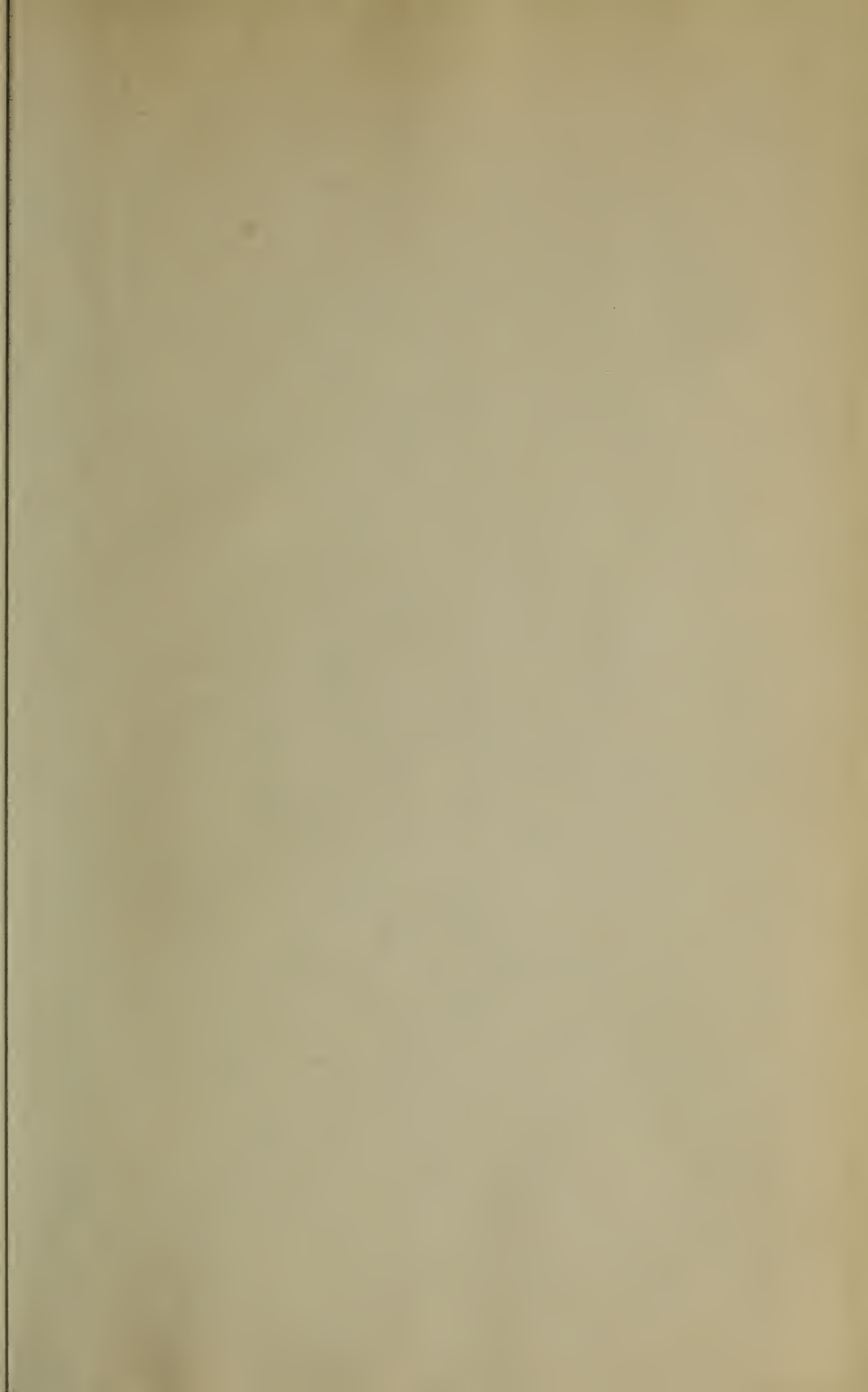
Date

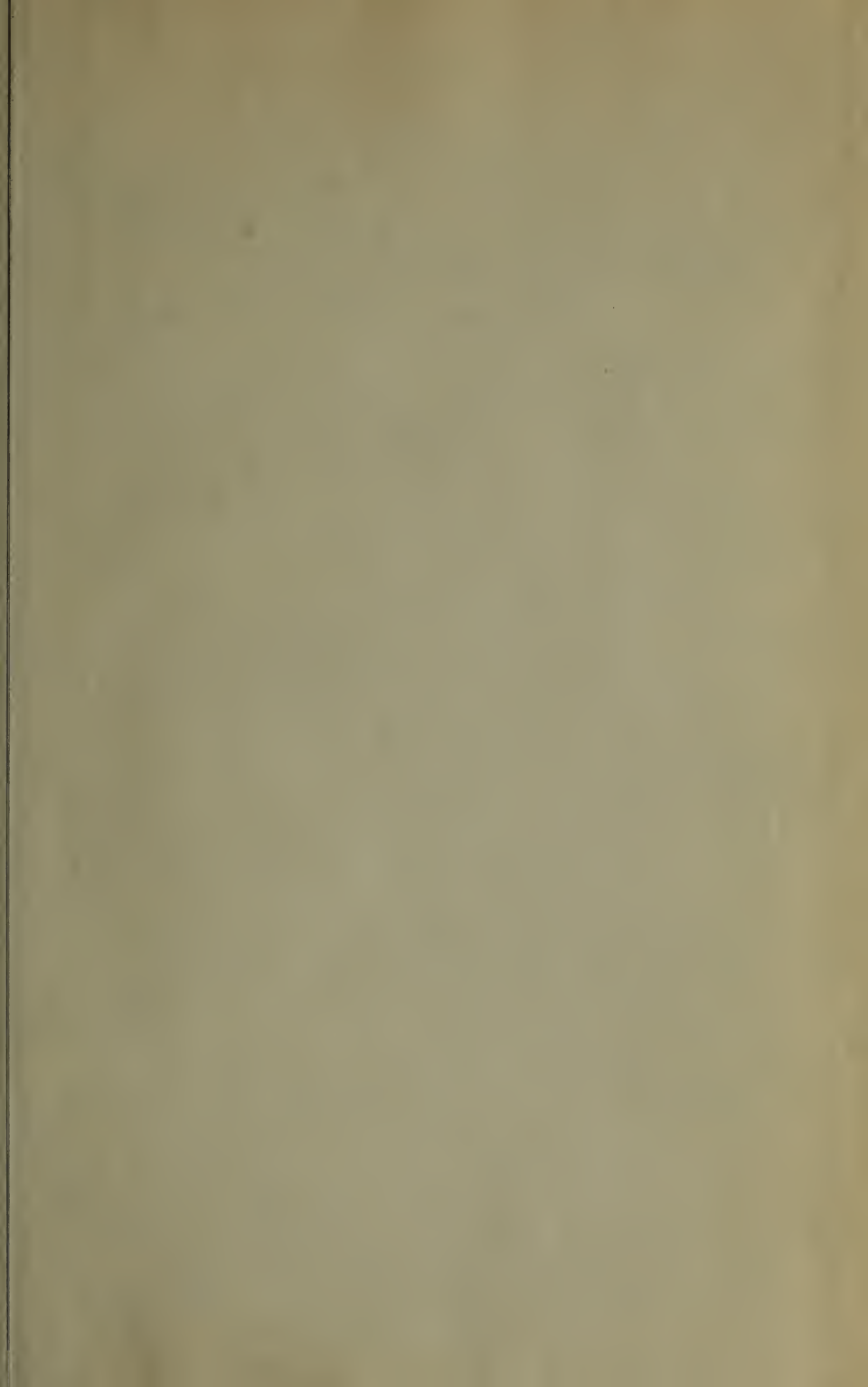




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WELLS BINDERY
WALTHAM, MASS.
DEC. 1949

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Bulletin of the
Lowell Textile Insti

1912-1914

ISSUED TO

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